TOYODENKI

# VF66B

*TOYO*
*INTELLIGENT*
*INVERTER*

# Operating Manual

~V/f Mode~

# Foreword

Thank you for choosing TOYO inverter product. This instruction manual is for TOYO VF66B inverter FULL mode (V/f mode). Before using TOYO VF66B inverter in Induction motor V/f mode, please read a set of instruction manuals (Installation, Basic operation, trouble shooting and Maintenance) to get familiarize with the feature of TOYO VF66B inverter and use this manual for those functions which are not covered in an instruction manual (basic operation edition).

TOYO VF66B inverter has many special features in addition to basic function in order to accommodate wide variety of applications and maximize performance of the system. For the special feature of VF66B, please refer to the value stated in the dedicated instruction manuals or test data report.

# Please read before use

## For safety

Before installing, operating, maintaining and inspecting the inverter, please read this manual and all other appendices thoroughly in order to get familiarize with the feature of the inverter, safely information and correct handling. In this manual, the safety instructions are classified in to two levels: DANGER and CAUTION. These signs have important instructions. Please follow the instructions without fail.

**DANGER** Indicates a hazardous situation which may result in death or serious injury if it is handled improperly.

**CAUTION** Indicates a hazardous situation which may result in moderate or minor injury or only in property damage if it is handled improperly. However, such a situation may lead to serious consequences depending on circumstances.

### CAUTION [Installation]

- Install the inverter on a metallic or non-flammable surface.
  Otherwise, it may cause a fire.
- Do not place flammable materials near the inverter.
  Doing so may cause a fire.
- Do not carry the inverter by the front cover.
  The inverter may drop and cause personal injury.
- Install the inverter on the surface that withstands its weight.
  Otherwise, it may drop and cause personal injury.
- Do not install or operate the inverter if it is damaged or have any of its parts missing.
  Operating the inverter in such a state may cause personal injury.

### DANGER [Wiring]

- Before wiring, make sure the power is OFF.
  Failure to do so may cause an electric shock or a fire.
- Make sure to connect grounding wire.
  Failure to do so may cause an electric shock or a fire.
- Wiring must be done by skilled technicians.
  Wiring by unauthorized persons may cause an electric shock or a fire.
- Wire the inverter after it is installed.
  Failure to do so may cause an electric shock or a fire.

### CAUTION [Wiring]

- Do not connect AC power to the output terminals (U, V or W).
  Doing so may cause an injury or a fire.
- Make sure that the rated voltage of the devise is conformed to the voltage of AC power.
  If not, injury or a fire may occur.
- Do not connect a resistance directly to the DC terminal ⊕1or between ⊕2 and ⊖ or ⊕1 and ⊕2.
  Doing so may cause a fire.
- Connect a designated ground-fault protection relay or ground-fault breaker to the inverter input R, S and T for ground-fault protection.
  Failure to do so may cause an electric shock or a fire.

## DANGER [Operation]

- Turn the power ON after fitting the front cover. Do not remove the cover while the power is ON.
  Failure to do so may cause an electrical shock.
- Do not operate any switch with wet hands.
  Failure to do so may cause an electrical shock.
- Do not touch the inverter terminals while the power is ON even if the inverter is in the idle state.
  Failure to do so may cause an electrical shock
- The stop button is effective only when the use of its function has been set. Provide a separate emergency stop button.
  There is possibility of personal injury.
- If the alarm is reset with the operation signal kept input, the inverter will suddenly restart. Reset the alarm after making sure that the operation signal is OFF
  Failure to do so may cause personal injury.

## CAUTION [Operation]

- The radiating fin and the radiating resistance are hot. Do not touch them.
  There is a risk of burn.
- The inverter can be set to operate in a wide range of speed. Operate the inverter after sufficiently checking the allowable range of the motor and equipment.
  Failure to do so may cause personal injury.
- If a holding brake is necessary, provide it separately.
  Failure to do so may cause personal injury.

## DANGER [Maintenance, inspection and parts replacement]

- Before inspecting the inverter, turn the power OFF, and wait for 10 minutes or more to make sure that the motor is stopped.
  Check the DC voltage between ⊕1 and ⊖ or ⊕2 and ⊖ to confirm that the voltage is 30V or less.
  Failure to do so may cause an electric shock or a fire.
- Check that the rated voltage of the devise is conformed to the voltage of AC power.
  If not, personal injury or a fire may occur.
- Unauthorized persons shall not perform maintenance or inspection of the inverter or part replacement. Use insulated tools for maintenance and inspection.
  Failure to do so may cause an electrical shock or a personal injury.

## DANGER [Other]

- Never modify the inverter.
  Doing so may cause an electrical shock or personal injury.

## CAUTION [General precautions]

Some illustrations given in this manual show the inverter from which the covers or safety shields have been removed to illustrate the details. Before operating the inverter, reinstall the covers and shields to their original positions and operate the inverter according to this manual.
These safety precautions and specifications stated in this manual are subject to change without notice.

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# Chapter 1 FULL mode

## 1.1. Feature of FULL mode

This inverter has total of 16 areas from A through S areas as described in table below. Unlike the SIMPLE mode, which only the parameter of limited area can be displayed/changed, in the FULL mode, all parameter of all area can be displayed/changed.

* If setting change is made in the FULL mode and then return to the SIMPLE mode, the items indicated by "○" in "Default value when operated in SIMPLE mode" column will be set to default value. However, if areas C through P are set in the FULL mode and change the mode to SIMPLE mode once and then back to the FULL mode again, the values previously set in the FULL mode will be selected for the areas C through P.

| Set area | Description | SIMPLE mode | Distinguishable between 1st set up block and 2nd set up block *1 | Default value when operated in SIMPLE mode | Remarks |
|---|---|---|---|---|---|
| Basic | Frequency setting<br>Jog frequency setting<br>Acceleration/deceleration time (1) and (2) | ○ | ○ | | |
| A | Max. frequency<br>Motor rating, with/without PG<br>Motor constant | ○ | ○ | | |
| b | Rewrite protection<br>Stop mode and its frequency<br>Instantaneous power failure/ reverse prohibition<br>Operation/Jog/frequency command input place select<br>Torque limit | ○ | ○ | | |
| c | Contact input (multi-function input) function selection | | △ | ○ | Standard terminal can be selected |
| d | Acceleration/deceleration time (3) and (4), and S-pattern acceleration/deceleration setting<br>Preset frequency<br>Jump frequency<br>MRH related | | ○ | ○ | |
| E | Boost mode<br>Regeneration stall prevention<br>Motor temperature compensation ON/OFF<br>Current control gain<br>Torque control mode<br>Simulation mode<br>Forward direction change | | ○ | ○ | |
| F | Over speed/over load/over torque protection related<br>Trace back<br>Cumulative operation timer<br>Other protection related | | ○ | ○ | |
| G | Analog input/output characteristics selection of optional circuit board.<br>Temperature detection option related<br>Line speed monitor adjustment | | △ | ○ | |
| H | Multi-function output selection<br>Data related to multi-function output | | ○ | ○ | |
| i | Built-in PLC<br>Drooping related<br>Operation mode (ASR/ATR/Priority)<br>2nd Speed control gain and etc.<br>Speed control method selection, positing and etc. | | ○ | ○ | |
| J | Communication option related | | △ | ○ | |
| L | Vdc adjusting gain<br>Analog input/output adjusting gain and offset<br>SIMPLE /FULL mode selection | | △ | | Set via S area |
| n | Inverter mode, inverter capacity | | ○ | | Set via S area |
| P | For built-in PLC | | △ | ○ | |
| S | Automatic measuring/initialization<br>Cumulative operation timer reset<br>ROM rewrite protection<br>(Only limited portion is rewritable in SIMPLE mode) | Limited part only | △ | — | Data in this area is not stored. |

*1 : The parameters which are distinguishable between 1st set up block and 2nd set up block are indicated by "○", whereas common parameters are indicated by "△".

## About the SIMPLIFIED and FULL

VF66B has two modes: SIMPLE mode and FULL mode.

| | Description |
|---|---|
| SIMPLE mode | Only the parameters required for basic operation can be displayed/changed. |
| FULL mode | All parameters can be displayed/changed. |

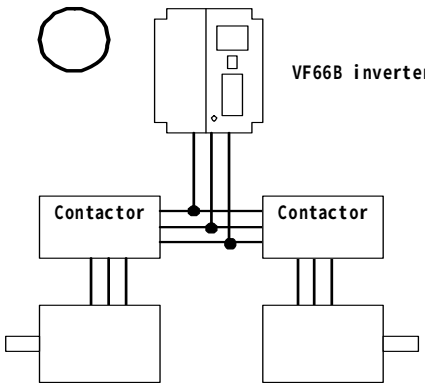
This manual describes FULL mode. For instruction for SIMPLE mode, please refer to the Operation manual (basic operation version).

## About the 1st and 2nd set-up blocks

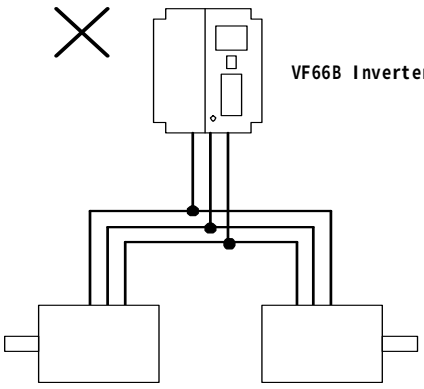
VF66B has two set up blocks 1st and 2nd; each set up block can set up inverter mode and parameter separately. VF66B permits selection of either sensor-less drive or sensored drive for one motor, or switching between two motors; ED motor and induction motor*1 (note: two motors can not be operated simultaneously). It is possible to know current usage of the set up block; 1st or 2nd, or which inverter mode out of three modes is currently used on the 1st and 2nd set up blocks by checking display on the console panel when the inverter is turned on.

*1: In case of switching between two motors, it is necessary to have contactors to switch motor wirings.

Note: For the method of switching between 1st set up block and 2nd set up block is done by external signal. Please refer to Chapter3 3.4 <C- area>, also Chapter4 4.4 <C- area> in Chapter 4.




Using both 1st and 2nd set up blocks, and use of contactors, switching between two different motors becomes possible. (Two motors cannot be operated simultaneously)




Motors cannot be operated with direct connection to the inverter.

## 1.2. Switching to Induction motor V/f mode

A method for switching inverter mode into Induction motor V/f mode is described below.

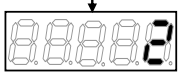
Note: This inverter has two set up blocks; 1st set up block and 2nd set up block, and user can select from them. In the default setting, 1st set up block is selected. For the switching method between 1st set up block and 2nd set up block, please refer to Chapter3 3.4 <C- area> and Chapter4 4.4 <C- area>.

①Press [MONI/FNC] key to FNC (function selection) mode. (LED-FNC will be lit)

②Use [↑][↓] keys to select "S-00". Press [SET] to confirm it.

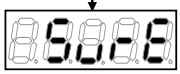
③Use [JOG/→] key to shift the digit to the right, and [↑][↓] keys to enter a number "1040", and then press [SET] key to confirm it**. If you input number except 「1040」, is displayed on the console.**

④"S-00" will appear again. Press [SET] to confirm.



⑤Use [JOG/→][↑][↓] keys to enter "2", then press [SET] to confirm.

**A message of** will be displayed sequentially.



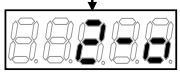
⑥"SurE"will be blinking on the display, press [SET] key to confirm.

⑦Selection for the 1st set-up block is displayed. Select "o" for Induction motor V/f mode. To change inverter mode, use [↑][↓] keys to select a mode, press [SET] key to confirm the selection.

o:Induction motor V/f mode

V:Induction motor vector mode

E:ED motor vector mode



⑧Selection for the 2nd set-up block is displayed. Select an inverter mode from "o", "V"or "E"using [↑][↓] keys. Press [SET] to confirm the selection.

＜In case of left figure, Induction motorV/f mode has been selected for the 2nd set-up mode.＞

is displayed for approx. 1sec. then displays and inverter mode change is completed.

Approx. 5sec. later, the display will return to display inverter type, capacity and voltage.

## 1.3. Switching to FULL mode

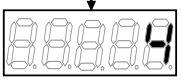
**Method to switch between FULL mode and SIMPLE mode is described below:**

①Press [MONI/FNC] key to FNC (function selection) mode. (LED-FNC will be lit)

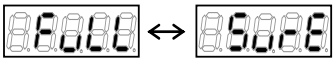
②Use [↑][↓] keys to select "S-00". Press [SET] to confirm.

③Use [JOG/→] key to shift the digit to the right, and [↑][↓] keys to enter a number "1040", and then press [SET] to confirm. **If you input number except 「1040」, ERROR is displayed on the console.**

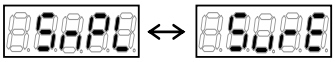
④"S-00" will appear again. Press [SET] to confirm.



⑤Use [JOG/→][↑][↓] keys to enter "4", then press [SET] to confirm.



・To change from SIMPLE mode into FULL mode, alternative display of "FuLL" and "SurE" will appear. Press [SET] to confirm the change.



・To change from FULL mode into SIMPLE mode, alternative display of "SnPL" and "SurE" will appear. Press [SET] to confirm the change.

**Note: SIMPLE mode has been selected as a factory default setting.**

## 1.4. Automatic tuning

### 1.4.1. Description of Automatic tuning

VF66B has an automatic tuning function which measures required information of the motor such as motor resistance and inductance, and set the parameter automatically. If the parameter of the motor is not set, it is needed to execute automatic tuning to set required parameter.

**In the Induction motor V/f mode, there are two automatic tunings:**

①DC mode automatic tuning (Forward rotation)

②DC mode automatic tuning (Reverse rotation)

• "DC mode automatic tuning" measures primary resistance and dead time compensation.

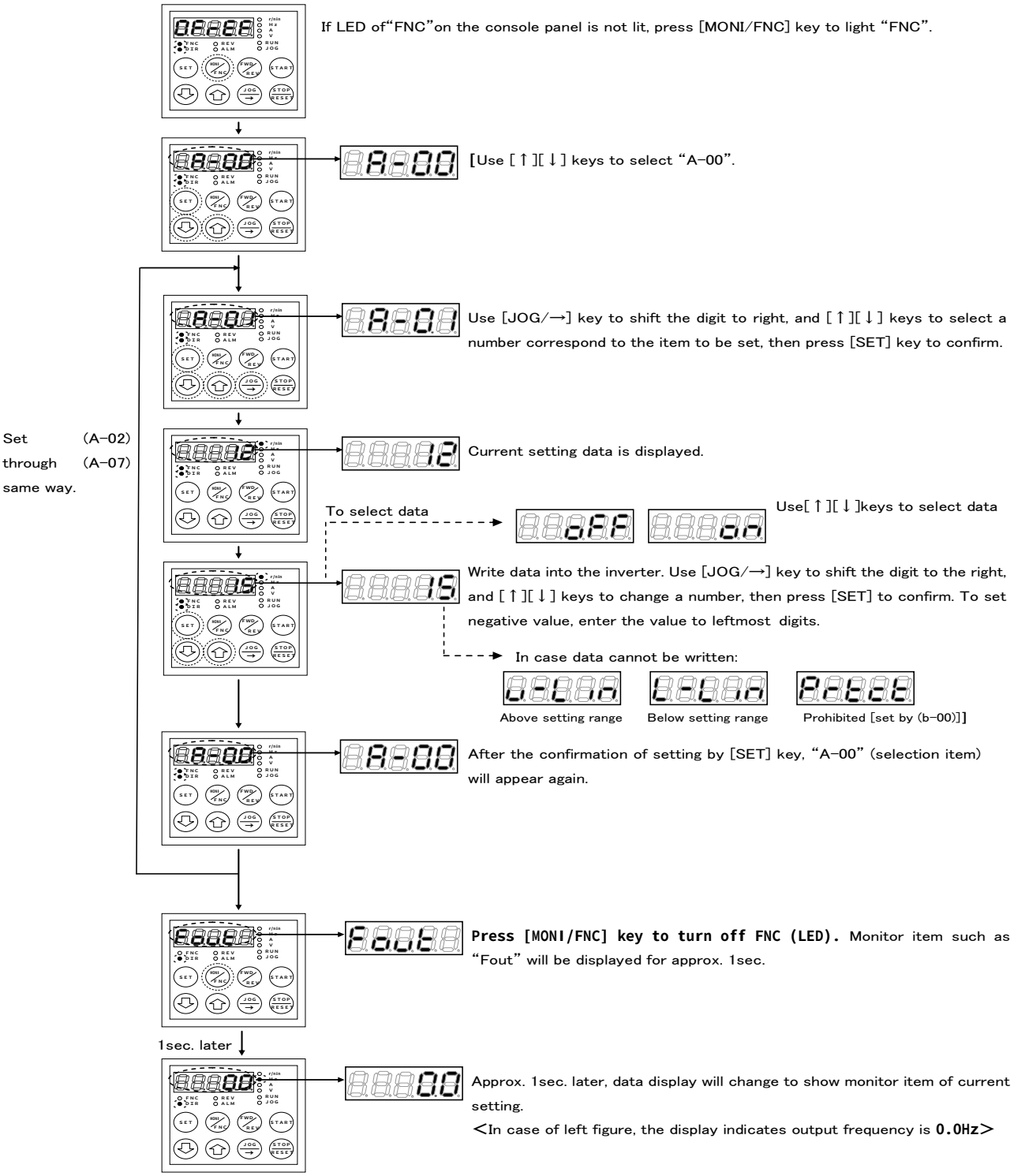
Note: Under normal conditions, perform "DC mode automatic tuning (Forward rotation)". Only when "DC mode automatic tuning (Forward rotation)" cannot be performed due to the relationship with load equipment etc., then "DC mode automatic tuning (Reverse rotation)" should be performed.

**Note: If required parameter of the motor to be operated is not set yet, automatic tuning should be performed. However, typical motor parameter is already set as a factory default so that the motor can be operated without executing automatic tuning. However, in order to bring out full performance of VF66B inverter, we recommend "DC automatic tuning" by combining the inverter with the motor.**

Note: When automatic tuning is performed, temperature of the motor must be cool enough (less than 25℃), otherwise due to effect on the motor characteristics, correct measurement cannot be achieved.

## 1.4.2. Requirement for automatic tuning

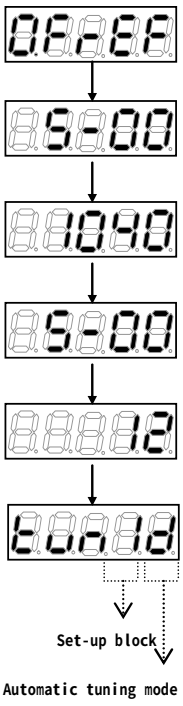
In order to perform automatic tuning, the rated value of the motor to be tuned must be set.
The rated value of the motor can be set by setting items A-00 through A-07 from the console. Set-up method by using console is explained below. (For more information about setting items A-00 through A-07, please refer to Chapter4 4.2 <A-area>)


If LED of"FNC"on the console panel is not lit, press [MONI/FNC] key to light "FNC".
[Use [↑][↓] keys to select "A-00".
Use [JOG/→] key to shift the digit to right, and [↑][↓] keys to select a number correspond to the item to be set, then press [SET] key to confirm.
Set (A-02) through (A-07) same way.
Current setting data is displayed.
To select data
Use[↑][↓]keys to select data
Write data into the inverter. Use [JOG/→] key to shift the digit to the right, and [↑][↓] keys to change a number, then press [SET] to confirm. To set negative value, enter the value to leftmost digits.
In case data cannot be written:
Above setting range
Below setting range
Prohibited [set by (b-00)]
After the confirmation of setting by [SET] key, "A-00" (selection item) will appear again.
Press [MONI/FNC] key to turn off FNC (LED). Monitor item such as "Fout" will be displayed for approx. 1sec.
1sec. later
Approx. 1sec. later, data display will change to show monitor item of current setting.
<In case of left figure, the display indicates output frequency is 0.0Hz>

## 1.4.3. Procedure of automatic tuning

**・Procedure for DC mode automatic tuning**

**Below is a concrete procedure for DC mode automatic tuning:**




①Press [MONI/FNC] key to FNC (function selection) mode. (LED-FNC will be lit)

②Use [↑][↓] keys to select "S-00". Press [SET] to confirm it.

③Use [JOG/→] key to shift the digit to the right, and [↑][↓] keys to enter a number "1040", and then press [SET] key to confirm it. **If you input number except 「1040」, EEEEE is displayed on the console.**

④"S-00" will appear again. Press [SET] to confirm.

⑤Use [JOG/→][↑][↓] keys to select a mode of automatic tuning. For DC mode automatic tuning, enter "12" (Forward rotation) or "13" (Reverse rotation). Press **[SET] to confirm.**

⑥An indication as on the left figure will appear showing set-up block and automatic tuning mode.

- Set-up block: '1'
- Automatic tuning mode: 'd' for DC mode automatic tuning.

<In case of the left figure, set-up block is 1, automatic tuning mode is DC mode automatic tuning>

⑦Press [JOG/→] key to start automatic tuning.

* Motor operation when DC mode automatic tuning (Four-pole motor)

After slowly turns about 1/2 rotation, motor may slowly turns forward or reversed about 1/2 rotation.

**(In case of induction motor, only small torque is produced so that the motor may not turn if load is present or mechanical brake is applied. Automatic tuning can be done even if motor is not turning.)**

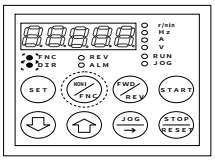
⑧Automatically the automatic tuning finishes. When the tuning finishes normally without problem, indication of "tunEd"will appear after the recording of measurement result. Press [STOP/RESET] key for 3 sec. to change the indication to show inverter type, capacity and voltage.

*Indication of protection of EEEEE will appear if any abnormality presents. Please refer to Chapter6 6.1.2 <Protection display and its handling> or 6.1.4 <Description of error display when automatic tuning> for more information.

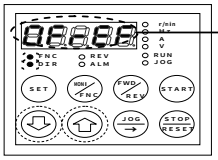
* For the detail of S-area, please refer to Chapter4, 4.16 <S-area>.

# Chapter 2 Parameter change from the console

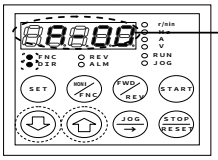
**Below is a concrete procedure to change parameters from the console:**



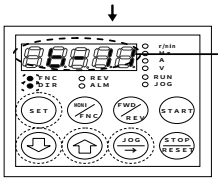
If LED of “FNC” on the console panel is not lit, press [MONI/FNC] key to light “FNC”.



Basic set-up area “0.FrEF” is displayed. Use [ ↑ ][ ↓ ] keys to move to desired set-up items.



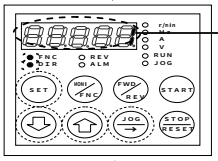
For the A through S areas, you can move to other set-up areas while alphabet part is blinking.



Use [JOG/⟶] key to shift the digit to right, and [ ↑ ][ ↓ ] keys to change a parameter, then press [SET] key to confirm.

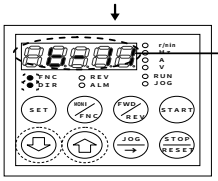
Please refer to Chapter3, <List of the Induction motor vector mode parameter> and Chapter4, <Description of the Induction motor vector mode parameters>.

**＜Left figure showing set up of the item “b-11”＞**



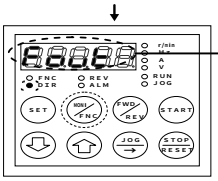
Use [ ↑ ][ ↓ ] keys to select appropriate number, press [SET] to confirm the number.

＜In case of the left figure, parameter is set to “1”.＞



The parameter you changed is once again displayed.

＜Left figure is indicating set-up of the item “b-11”＞



Press [MONI/FNC] key to turn off the LED of FNC. Monitor item such as “**Fout**” will be displayed for approx. 1sec. then return to show data of monitor items.

# Chapter 3 List of V/f mode parameter

Below are lists of parameters for V/f mode for each item in each area.

* For description of each parameter, please refer to Chapter4, <Description of V/f mode parameter>.

## 3.1. Basic set-up area

Rewritable when in operation : Y = Yes N = No

| Console display | Set-up items | Set-up range (item selection) | Default setting | Unit | Rewritable |
|---|---|---|---|---|---|
| 0.FrEF | Frequency command | -Maximum frequency (A-00) to Maximum frequency (A-00). | 0.5 | Hz | Y |
| 1.FJoG | Forward JOG frequency | Minimum frequency (A-01) to up to 30.0 | 1.0 | Hz | Y |
| 2.rJoG | Reverse JOG frequency | -30.0 to —Minimum frequency (A-01) | -1.0 | Hz | Y |
| 3.Acc1 | Acceleration time(1) | 0.0 to 3600.0 | 30.0 | sec | Y |
| 4.dEc1 | Deceleration time(1) | 0.0 to 3600.0 | 30.0 | sec | Y |
| 5.Acc2 | Acceleration time(2) | 0.0 to 3600.0 | 0.3 | sec | Y |
| 6.dEc2 | Deceleration time(2) | 0.0 to 3600.0 | 0.3 | sec | Y |
| 7.tbSt | Torque boost amount | 0.0 to 20.0 | 0.0 | % | Y |
| 8.dCbr | DC brake voltage | 0.0 to 100.0 | 0.0 | % | Y |
| 9.Stb | Stabilizer amount | 0.0 to 20.0 | 0.0 | % | Y |

## 3.2. A-area (Max. frequency, motor rate, parameter set-up area)

Rewritable when in operation : Y = Yes N = No

| Console display | Set-up items | Set-up range (item selection) | Default setting | Unit | Rewritable |
|---|---|---|---|---|---|
| A-00 | Maximum frequency | 15.0 to 400.0 | 60.0 | Hz | N |
| A-01 | Minimum frequency | 0.0 to 10.0 | 0.5 | Hz | Y |
| A-02 | Rated motor capacity | 0 to rated capacity of inverter* | Inverter rate | kW | N |
| A-03 | Rated motor voltage | (200V class) 70 to 230<br>(400V class) 140 to 460 | 200<br>400 | V | N |
| A-04 | Rated motor current | 20% to 150% of inverter rated current | Inverter rate | A | N |
| A-05 | Rated motor speed | 400 to 24000 | 1760 | r/min | N |
| A-06 | Number of motor pole | 2 to 12 | 4 | Pole | N |
| A-07 | Rated motor frequency | 15.0 to Maximum frequency (A-00) | 60.0 | Hz | N |
| A-08 | — | — | — | — | — |
| A-09 | PWM carrier frequency | 1.0 to 6.0 | 2.0 | kHz | N |
| A-10 | — | — | — | — | — |
| A-11 | DeadTime compensation (U phase+) | 0.00 to 9.99 | Depend on inverter rate*1 | μsec | N |
| A-12 | DeadTime compensation (U phase-) | 0.00 to 9.99 | | μsec | N |
| A-13 | DeadTime compensation (V phase+) | 0.00 to 9.99 | | μsec | N |
| A-14 | DeadTime compensation (V phase-) | 0.00 to 9.99 | | μsec | N |
| A-15 | DeadTime compensation (W phase+) | 0.00 to 9.99 | | μsec | N |
| A-16 | DeadTime compensation (W phase-) | 0.00 to 9.99 | | μsec | N |
| A-17 | Motor primary resistance | (Setting range differs in inverter rate)*1 | | mΩ | N |

*If rated voltage of the motor is larger than 190V (200V class) / 380V (400V class), the maximum value of the setting range will be proportionally larger.

*1: Please refer to Chapter4 4.2 <A-area> for factory default values of A-11 through A-17 and setting range of A-17.

## 3.3. b-area (Operation mode, operation sequence setting area)

Rewritable when in operation : Y = Yes N = No

| Console display | Set-up items | Set-up range (item selection) | Default setting | Unit | Rewritable |
|---|---|---|---|---|---|
| b-00 | Setting data rewrite protection | OFF (Inactive)<br>ON (Activate protection) | OFF | — | N |
| b-01 | Stop mode selection | 0: Free stop<br>1: Deceleration stop<br>2: Deceleration stop with DC brake | 1 | — | Y |
| b-02 | Stop frequency | 0 to 30.0 | 1.0 | Hz | Y |
| b-03 | DC brake operation time | 0 to 10.0 | 0.0 | sec | Y |
| b-04 | — | — | — | — | — |
| b-05 | JOG stop mode selection | 0: Free stop<br>1: Deceleration stop<br>2: Deceleration stop with DC brake | 0 | — | Y |
| b-06 | JOG stop frequency | 0.0 to 10.0 | 1.0 | Hz | Y |
| b-07 | Instantaneous power interruption restart | OFF (Inactive)<br>ON (Active) | OFF | — | N |
| b-08 | Reverse prohibition mode selection | 0: Normal<br>1: Prohibition of nonconforming rotation against command<br>2: Reverse prohibition | 0 | — | N |

| Console display | Set-up items | Set-up range (item selection) | Default setting | Unit | Rewritable |
|---|---|---|---|---|---|
| b-09 | Commanding place when coupled | 0: Terminal block<br>1: Console (SET66)<br>2: Digital communication option | 1 | — | N |
| b-10 | Frequency commanding place selection | 0: Coupled<br>1: Analog input(1)[terminal block](AIN1)<br>2: Console (SET66-Z)<br>3: Digital communication option<br>4: Analog input(2)[terminal block for IO66-Z option or digital communication option](AIN2)<br>5: (For future extension option)*1<br>6: Analog input(3)[IO66-Z option terminalblock](AIN3)<br>7: Built-in PLC | 0 | — | N |
| b-11 | Operation commanding place selection | 0: Coupled<br>1: Terminal block<br>2: Console (SET66-Z)<br>3: Digital communication option | 0 | — | N |
| b-12 | JOG commanding place selection | 0: Coupled<br>1: Terminal block<br>2: Console (SET66-Z)<br>3: Digital communication option | 0 | — | N |
| b-13 | Powering torque limit | 0 to 150(max. 0 to 200% depend on motor) | 150 | % | Y |
| b-14 | Regenerative torque limit | -150 to 0(max. -200 to 0% depend on motor) | -150 | % | Y |
| b-15 | Powering torque limit usage selection | OFF (not used)<br>ON (used) | ON | — | N |
| b-16 | Regenerative torque limit usage selection | OFF (not used)<br>ON (used) | ON | — | N |
| b-17 | Analog frequency command characteristic selection | 0: 0 to ±10V<br>1: 0 to 10V<br>2: 4 to 20mA | 1 | — | N |
| b-18 | Analog frequency command upper limit frequency | Absolute value of Analog frequency command lower limit frequency (b-19) to 100.0 | 100.0 | % | Y |
| b-19 | Analog frequency command lower limit frequency | -Analog frequency command upper limit speed (b-18) to Analog speed command upper limit frequency (b-18) | 0.0 | % | Y |
| b-20 | Analog_input_ZeroLimit_voltage | 0.000 to 1.000 | 0.000 | V | Y |
| b-21 | Analog output(1) characteristics selection | 0: Output voltage<br>1: Output current<br>2: Torque output<br>3: Frequency<br>4: Frequency command<br>5: Built-in PLC output<br>6: Calibration<br>7: Internal monitor<br>---<br>-1: 6F frequency<br>-2: 6F speed<br>-3: 6F calibration | 1 | — | N |

*1: b-10=5 is for a future extension option. Under normal conditions, please do not use this setting.

## 3.4. c-area (Multi-function input related setting area)

Rewritable when in operation : Y = Yes N = No

| Console display | Set-up items | Set-up range (item selection) | Default setting | Unit | Rewritable |
|---|---|---|---|---|---|
| c-00 | Multifunction input place selection | 0: Terminal block<br>1: Digital communication option | 0 | — | N |
| c-01 | Multifunction input terminal (1) function selection | 0: Preset frequency selection 1<br>1: Preset frequency selection 2<br>2: Preset frequency selection 3<br>3: Accel./decel. time selection 1<br>4: Accel./decel. time selection 2<br>5: Frequency up command (MRH mode)<br>6: Frequency down command (MRH mode)<br>7: Frequency hold<br>8: S-pattern accel./decel. prohibition<br>9: Max. frequency reduction<br>10: Droop control disabled<br>11: No function<br>12: Forward/reverse operation command selection<br>13: DC brake command<br>14: No function<br>15: External failure signal 1 (protection relay 86A enabled)<br>16: External failure signal 2 (protection relay 86A enabled)<br>17: External failure signal 3 (protection relay 86A enabled)<br>18: External failure signal 4 (protection relay 86A enabled)<br>19: External failure signal 1 (protection relay 86A disabled)<br>20: External failure signal 2 (protection relay 86A disabled)<br>21: External failure signal 3 (protection relay 86A disabled)<br>22: External failure signal 4 (protection relay 86A disabled)<br>23: Trace back external trigger<br>24: 2nd set-up block selection<br>25: Emergency stop (B contact)<br>26: No function<br>27: Frequency commanding terminal block selection<br>28: No function<br>29: Operation command [reverse] (STARTR)<br>30: Jog command [forward] (JOGF)<br>31: Jog command [reverse] (JOGR)<br>32: Emergency stop (A contact)<br>33: Protection reset (RESET)<br>34: External signal input 1<br>35: External signal input 2<br>36: External signal input 3<br>37: External signal input 4 | 29 | — | N |
| c-02 | Multifunction input terminal (2) function selection | | 30 | — | N |
| c-03 | Multifunction input terminal (3) function selection | | 31 | — | N |
| c-04 | Multifunction input terminal (4) function selection | | 32 | — | N |
| c-05 | Multifunction input terminal (5) function selection | | 33 | — | N |
| c-06 | Multifunction input terminal (6) function selection | | 0 | — | N |
| c-07 | Multifunction input terminal (7) function selection | | 1 | — | N |
| c-08 | Multifunction input terminal (8) function selection | | 2 | — | N |
| c-09 | Multifunction input terminal (9) function selection | | 3 | — | N |
| c-10 | Multifunction input terminal (10) function selection | | 4 | — | N |
| c-11 | Multifunction input terminal (11) function selection | | 5 | — | N |
| c-12 | Multifunction input terminal (12) function selection | | 6 | — | N |
| c-13 | Multifunction input terminal (13) function selection | | 7 | — | N |
| c-14 | Multifunction input terminal (14) function selection | | 8 | — | N |
| c-15 | Multifunction input terminal (15) function selection | | 9 | — | N |
| c-16 | Multifunction input terminal (16) function selection | | 10 | — | N |
| c-17 | Multifunction input terminal (17) function selection | | 11 | — | N |
| | | | | | |

*1: Selection 34 and 35 for c-01 through c-17 are for future extension option. Under normal conditions, please do not use these settings.

## 3.5. d-area (Acceleration/deceleration time, frequency jump function, MRH function selection area)

**Rewritable when in operation: Y = Yes N = No**

| Console display | Set-up items | Set-up range (item selection) | Default setting | Unit | Rewritable |
|---|---|---|---|---|---|
| d-00 | Acceleration/Deceleration time selection | 0: Accel./decel. Time (1)<br>1: Accel./decel. Time (2)<br>2: Accel./decel. Time (3)<br>3: Accel./decel. Time (4) | 0 | — | N |
| d-01 | JOG acceleration / deceleration time selection | | 1 | — | N |
| d-02 | Acceleration time(3) | 0.0 to 3600.0 | 30.0 | sec | Y |
| d-03 | Deceleration time(3) | 0.0 to 3600.0 | 30.0 | sec | Y |
| d-04 | Acceleration time(4) | 0.0 to 3600.0 | 30.0 | sec | Y |
| d-05 | Deceleration time(4) | 0.0 to 3600.0 | 30.0 | sec | Y |
| d-06 | S-pattern acceleration/deceleration usage selection | OFF (not use)<br>ON (use) | OFF | — | N |
| d-07 | S-pattern rise time(1) | 0.0 to 60.0 | 0.1 | sec | Y |
| d-08 | S-pattern acceleration reach time(1) | 0.0 to 60.0 | 0.1 | sec | Y |
| d-09 | S-pattern fall time(1) | 0.0 to 60.0 | 0.1 | sec | Y |
| d-10 | S-pattern deceleration reach time(1) | 0.0 to 60.0 | 0.1 | sec | Y |
| d-11 | S-pattern rise time(2) | 0.0 to 60.0 | 0.1 | sec | Y |
| d-12 | S-pattern acceleration reach time(2) | 0.0 to 60.0 | 0.1 | sec | Y |
| d-13 | S-pattern fall time(2) | 0.0 to 60.0 | 0.1 | sec | Y |
| d-14 | S-pattern deceleration reach time(2) | 0.0 to 60.0 | 0.1 | sec | Y |
| d-15 | Preset frequency(1) | -Maximum frequency (A-00) to Maximum frequency (A-00) | 0.0 | Hz | Y |
| d-16 | Preset frequency(2) | | 0.0 | Hz | Y |
| d-17 | Preset frequency(3) | | 0.0 | Hz | Y |
| d-18 | Preset frequency(4) | | 0.0 | Hz | Y |
| d-19 | Preset frequency(5) | | 0.0 | Hz | Y |
| d-20 | Preset frequency(6) | | 0.0 | Hz | Y |
| d-21 | Preset frequency(7) | | 0.0 | Hz | Y |
| d-22 | Jump frequency(1) | 0 to Maximum frequency (A-00) | 0.0 | Hz | Y |
| d-23 | Jump frequency(2) | | 0.0 | Hz | Y |
| d-24 | Jump frequency(3) | | 0.0 | Hz | Y |
| d-25 | Jump frequency(4) | | 0.0 | Hz | Y |
| d-26 | Jump frequency width | 0.0 to 10.0 | 0.0 | Hz | Y |
| d-27 | MRH function usage selection | OFF (not use)<br>ON (use) | OFF | — | N |
| d-28 | MRH upper limit frequency | MRH lower limit frequency (d-29) To Maximum frequency (A-00) | 5.0 | Hz | Y |
| d-29 | MRH lower limit frequency | -Maximum frequency (A-00) to MRH upper limit frequency (d-28) | 0.0 | Hz | Y |

## 3.6. E-area (Frequency characteristic related setting area)

Rewritable when in operation: Y = Yes N = No

| Console display | Set-up items | Set-up range (item selection) | Default setting | Unit | Rewritable |
|---|---|---|---|---|---|
| E-00 | Regeneration stall prevention function usage selection | OFF (not use)<br>ON (use) | OFF | — | N |
| E-01 | Regeneration stall prevention voltage | (200V class) 320 to 360<br>(400V class) 640 to 720 | 340<br>680 | V | Y |
| E-02 | Start mode selection | 0: Free start<br>1: Minimum frequency start | 1 | — | N |
| E-03 | Forward direction change | OFF (Forward)<br>ON (Reverse) | OFF | — | N |
| E-04 | Simulation mode | OFF (without simulated operation)<br>ON (with simulated operation) | OFF | — | N |
| E-05 | Autoboost mode | OFF (Manual boost)<br>ON (Auto-boost) | OFF | — | N |
| E-06 | Restart delay time | 0.100 to 10.000 | 0.100 | sec | Y |
| E-07 | V/f pattern selection | 0: V/f liner<br>1: Square reduction<br>2: polygonal line | 0 | — | N |
| E-08 | Voltage at turnoff point | (200V class) 0 to 230<br>(400V class) 0 to 460 | 0 | V | N |
| E-09 | Frequency at turnoff point | 0.0 to Maximum frequency (A-00) | 0.0 | Hz | N |

## 3.7. F-area (Built-in DB (dynamic brake) operation, protection function, trace back setting area)

**Rewritable when in operation: Y = Yes N = No**

| Console display | Set-up items | Set-up range (item selection) | Default setting | Unit | Rewritable |
|---|---|---|---|---|---|
| F-00 | Built-in DB (dynamic brake) operation level | (200V class) 320.0 to 360.0<br>(400V class) 640.0 to 720.0 | 340.0<br>680.0 | V | Y |
| F-01 | Forward overfrequency setting | 0.0 to 150.0 | 105.0 | % | N |
| F-02 | Reverse overfrequency setting | -150.0 to 0.0 | -105.0 | % | N |
| F-03 | Overload protection setting | 20 to 110 | 100 | % | Y |
| F-04 | Cumulative operation timer (1-Capacitor ) | 0 to 65535 | Depend on inverter capacity*1 | Hr | N |
| F-05 | Cumulative operation timer (2-Fan ) | 0 to 65535 | Depend on inverter capacity*1 | Hr | N |
| F-06 | Motor overheat protection operation selection | OFF (without protection operation)<br>ON (with protection operation) | OFF | — | N |
| F-07 | Protection relay (86A) operation selection upon power failure | OFF (without protection operation)<br>ON (with protection operation) | OFF | — | N |
| F-08 | Protection retry count setting | 0 to 5 | 0 | count | Y |
| F-09 | Ext.ernal failure(1) detection delay time | 0.0 to 30.0 | 0.0 | sec | Y |
| F-10 | Ext.ernal failure(2) detection delay time | 0.0 to 30.0 | 0.0 | sec | Y |
| F-11 | Ext.ernal failure(3) detection delay time | 0.0 to 30.0 | 0.0 | sec | Y |
| F-12 | Ext.ernal failure(4) detection delay time | 0.0 to 30.0 | 0.0 | sec | Y |
| F-13 | Traceback pitch | 0 to 100 | 1 | msec | Y |
| F-14 | Traceback trigger point | 1 to 99 | 80 | — | Y |
| F-15 | Traceback CH1 selection | 0 to 12 | 0 | — | Y |
| F-16 | Traceback CH2 selection | 0 to 12 | 0 | — | Y |
| F-17 | Traceback CH3 selection | 0 to 12 | 0 | — | Y |
| F-18 | Traceback CH4 selection | 0 to 12 | 0 | — | Y |
| F-19 | Traceback CH5 selection | 0 to 12 | 0 | — | Y |
| F-20 | Traceback CH6 selection | 0 to 12 | 0 | — | Y |
| F-21 | Traceback CH7 selection | 0 to 12 | 0 | — | Y |
| F-22 | Traceback CH8 selection | 0 to 12 | 0 | — | Y |
| F-23 | Traceback CH9 selection | 0 to 12 | 0 | — | Y |
| F-24 | Traceback CH10 selection | 0 to 12 | 0 | — | Y |
| F-25 | Traceback CH11 selection | 0 to 12 | 0 | — | Y |
| F-26 | Traceback CH12 selection | 0 to 12 | 0 | — | Y |

***1: Please refer to Chapter4 4.7 <F-area> for factory default data of F-04 and F-05.**

## 3.8. G-area (Analog input/output setting area)

**Rewritable when in operation: Y = Yes N = No**

| Console display | Set-up items | Set-up range (item selection) | Default setting | Unit | Rewritable |
|---|---|---|---|---|---|
| G-00 | Temperature detection selection | 0: not use<br>1: thermistor (TVTH66-Z, optional)<br>2: pt100 [thermocouple](TVPT66-Z, optional) | 0 | — | N |
| G-01 | Temperature detection offset adjustment | -20.0 to 20.0 | 0.0 | °C | Y |
| G-02 | Temperature detection gain adjustment | 50.0 to 150.0 | 100.0 | — | Y |
| G-03 | Analog input (2) characteristics selection | 0:0 to ±10V<br>1:0 to 10V<br>2:4 to 20mA | 1 | — | N |
| G-04 | Analog input (2) upper limit frequency | Absolute value of analog input (2) lower limit frequency (G-05) to 100.0 | 100.0 | % | Y |

| Console display | Set-up items | Set-up range (item selection) | Default setting | Unit | Rewritable |
|---|---|---|---|---|---|
| G-05 | Analog input (2) lower limit frequency | -Analog input(2) upper limit frequency (G-04) to Analog input(2) upper limit frequency (G-04) | 0.0 | % | Y |
| G-06 | Analog input (3) characteristics selection | 0:0 to ±10V<br>1:0 to 10V<br>2: not use<br>3: Pulse train (0[Hz] to 150[kHz]) | 1 | — | N |
| G-07 | Analog input (3) upper limit frequency | Absolute value of Analog input (3) lower limit frequency (G-08) to 100.0 | 100.0 | % | Y |
| G-08 | Analog input (3) lower limit frequency | -Analog input(3) upper limit frequency (G-07) to Analog input(3) upper limit frequency (G-07) | 0.0 | % | Y |
| G-09 | Analog output(2) characteristics selection | 0: Output voltage<br>1: Output current<br>2: Torque output<br>3: Frequency<br>4: Frequency command<br>5: Built-in PLC output<br>6: Calibration<br>7: Internal monitor | 1 | — | N |
| G-10 | Analog output(3) characteristics selection | 0: Output voltage<br>1: Output current<br>2: Torque output<br>3: Frequency<br>4: Frequency command<br>5: Built-in PLC output<br>6: Calibration<br>7: Internal monitor<br>8: Output voltage (4 to 20mA)<br>9: Output current (4 to 20mA)<br>10: Torque output (4 to 20mA)<br>11: Frequency (4 to 20mA)<br>12: Frequency command (4 to 20mA)<br>13: Built-in PLC output (4 to 20mA)<br>14: Calibration (12mA output) | 0 | — | N |
| G-11 | Analog input (4) characteristics selection | 0: 0 to ±10V<br>1: 0 to 10V<br>2: 4 to 20mA | 1 | — | N |
| G-12 | Analog input (5) characteristics selection | 0: 0 to ±10V<br>1: 0 to 10V<br>2: not use<br>3: Pulse train (0[Hz] to 150[kHz]) | 1 | — | N |
| G-13 | Analog output(4) characteristics selection | 0: Output voltage<br>1: Output current<br>2: Torque output<br>3: Frequency<br>4: Frequency command<br>5: Built-in PLC output<br>6: Calibration<br>7: Internal monitor | 2 | — | N |

| Console display | Set-up items | Set-up range (item selection) | Default setting | Unit | Rewritable |
|---|---|---|---|---|---|
| G-14 | Analog output(5) characteristics selection | 0: Output voltage<br>1: Output current<br>2: Torque output<br>3: Frequency<br>4: Frequency command<br>5: Built-in PLC output<br>6: Calibration<br>7: Internal monitor<br>8: Output voltage (4 to 20mA)<br>9: Output current (4 to 20mA)<br>10: Torque output (4 to 20mA)<br>11: Frequency (4 to 20mA)<br>12: Frequency command (4 to 20mA)<br>13: Built-in PLC output (4 to 20mA)<br>14: Calibration (12mA output) | 3 | — | N |
| G-15 | Line speed monitor adjustment | 0.0 to 2000.0 | 0.0 | — | Y |
| G-16 | Analog input monitor display selection | 1: Analog input (1) [AIN1]<br>2: Analog input (2) [AIN2]<br>3: Analog input (3) [AIN3]<br>4: Analog input (4) [AIN4]<br>5: Analog input (5) [AIN5] | 1 | — | Y |

## 3.9. H-area (Multi-function output setting area)

**Rewritable when in operation: Y = Yes N = No**

| Console display | Set-up items | Set-up range (item selection) | Default setting | Unit | Rewritable |
|---|---|---|---|---|---|
| H-00 | Multifunction output terminal(1) function selection | 0: not used<br>1: Frequency detection (1) (Frequency = detection setting)<br>2: Frequency detection (1) (Frequency ≧ detection setting)<br>3: Frequency detection (1) (Frequency ≦ detection setting)<br>4: Frequency detection (2) (Frequency = detection setting)<br>5: Frequency detection (2) (Frequency ≧ detection setting)<br>6: Frequency detection (2) (Frequency ≦ detection setting)<br>7: Reach setting<br>8: Torque detection<br>9: Torque detection (absolute value)<br>10: Power failure<br>11: Overload pre-alarm<br>12: Retrying<br>13: in reverse operation<br>14: Protection operation code*<br>15: not used<br>16: in operation<br>17: (For future extension option)*1<br>18: Timer 1 elapse<br>19: Timer 2 elapse<br>20: 2nd set-up block selected<br>21: Fan motor failed | 7 | — | N |
| H-01 | Multifunction output terminal(2) function selection | | 1 | — | N |
| H-02 | Multifunction output terminal(3) function selection | | 0 | — | N |
| H-03 | Multifunction output terminal(4) function selection | | 8 | — | N |
| H-04 | Multifunction output terminal(5) function selection | | 2 | — | N |
| H-05 | Multifunction output terminal(6) function selection | | 3 | — | N |
| | | | | | |
| H-06 | Frequency detection(1) | -Maximum frequency (A-00) to Maximum frequency (A-00) | 0.0 | Hz | Y |
| H-07 | Frequency detection(2) | -Maximum frequency (A-00) to Maximum frequency (A-00) | 0.0 | Hz | Y |
| H-08 | Frequency detection width | 0.0 to 10.0 | 0.0 | Hz | Y |
| H-09 | Torque detection (with polarity) | -205 to 205 | 0 | % | Y |
| H-10 | Torque detection (absolute value) | 0 to 205 | 0 | % | Y |
| H-11 | Overload pre-alarm operation level setting | 0 to 100 | 50 | % | Y |
| H-12 | Maximum. frequency reduction rate | 50.0 to 100.0 | 90.0 | % | Y |

***1: Selection 17 for H-00 through H-05 is for a future extension option. Under normal conditions, please do not use this setting.**

## 3.10. i-area (Droop control, mechanical loss compensation setting area)

**Rewritable when in operation: Y = Yes N = No**

| Console display | Set-up items | Set-up range (item selection) | Default setting | Unit | Rewritable |
|---|---|---|---|---|---|
| i-00 | PLCL function usage selection | OFF (not use)<br>ON (use) | OFF | — | N |
| i-01 | PLCH function usage selection | 0: OFF (not use)<br>1: PLCH ON<br>2: PLCH ON (frequency input = PLCH output) | 0 | — | N |
| i-02 | Droop control usage selection | OFF (not use)<br>ON (use) | OFF | — | N |
| i-03 | Droop start frequency | 0.0 to 100.0 | 0.0 | % | Y |
| i-04 | Droop rate changeover frequency | 0.0 to 100.0 | 0.0 | % | Y |
| i-05 | Droop rate | 0.0 to 50.0 | 0.0 | % | Y |

| | | | | | |
|---|---|---|---|---|---|
| i-06 | Droop start torque | 0.0 to 90.0 | 0.0 | % | Y |

## 3.11. J-area (Digital communication option setting area)

Rewritable when in operation: Y = Yes N = No

| Console display | Set-up items | Set-up range (item selection) | Default setting | Unit | Rewritable |
|---|---|---|---|---|---|
| J-00 | Digital communication option selection | 0: OFF<br>1: OPCN66-Z<br>2: ASYC66-Z<br>3: DNET66-Z<br>4: PBUS66-Z<br>5: IO66-Z<br>6: (For future extension option)*1<br>7: CC66-Z | 0 | — | N |
| J-01 | ASYC66-Z/CC66-Z baud rate | (ASYC66-Z)<br>0: 1200bps<br>1: 2400bps<br>2: 4800bps<br>3: 9600bps<br>4: 19200bps<br>5: 38400bps<br>(CC66-Z)<br>0: 156kbps<br>1: 625kbps<br>2: 2.5Mbps<br>3: 5Mbps<br>4: 10Mbps<br>5: 10Mbps | 4 | — | Y |
| J-02 | OPCN66-Z baud rate | 0: 125kbps<br>1: 250kbps<br>2: 500kbps<br>3: 1Mbps<br>4: (For factory adjustment) *2 | 3 | — | N |
| J-03 | PBUS66-Z slave address | 0 to 126 | 2 | — | N |
| J-04 | OPCN66-Z input | 3 to 19 | 14 | — | N |
| J-05 | OPCN66-Z output | 2 to 12 | 6 | — | N |
| J-06 | (For future extension option) | Please stay on the default value. | 0 | — | N |
| J-07 | ASYC66-Z.OPCN66-Z transmission selection/CC66-Z version selection | (ASYC66-Z)<br>0: 0ms<br>1: 5ms<br>2: 10ms<br>3: 20ms<br>4: 40ms<br>5: 60ms<br>6: 100ms<br>(CC66-Z)<br>Version / Exclusive station<br>0: 1.1 / 1<br>1: 1.1 / 2<br>2: 1.1 / 3<br>3: 1.1 / 4<br>4: 2.0(2×) / 1<br>5: 2.0(4×) / 1<br>6: 2.0(8×) / 1<br>(OPCN66-Z)<br>Baud rate (J-02)[bps]<br>125k / 250k<br>0: 200μs / 200μs<br>1: 200μs / 200μs<br>2: 200μs / 200μs<br>3: 200μs / 200μs<br>4: 200μs / 150μs<br>5: 200μs / 100μs<br>6: 200μs / 100μs<br>Baud rate (J-02)[bps]<br>500k / 1M<br>0:200μs / 200μs<br>1:200μs / 200μs<br>2:200μs / 200μs<br>3:200μs / 200μs<br>4:150μs / 150μs<br>5:100μs / 100μs<br>6:50μs / 50μs | 0 | — | N |
| J-08 | ASYC66-Z/PBUS66-Z Communication mode selection | (ASYC66-Z)<br>0: standard mode<br>1: Positioning mode 1<br>2: positioning mode 2<br>(PBUS66-Z)<br>0: PROFIDRIVE mode<br>1: Factory original mode<br>2: Special mode | 0 | — | N |

| Console display | Set-up items | Set-up range (item selection) | Default setting | Unit | Rewritable |
|---|---|---|---|---|---|
| J-09 | DNET66-Z output instance number setting | 0: Instance No.20<br>1: Instance No.21<br>2 to 10: (Factory original communication mode) | 0 | — | N |
| J-10 | DNET66-Z input instance number setting | 0: Instance No.70<br>1: Instance No.71<br>2 to 15: (Factory original communication mode) | 0 | — | N |
| J-11 | DNET66-Z speed scale setting | -126 to 127 | 3 | — | N |
| J-12 | DNET66-Z monitor data number setting | 0 to 119 | 3 | — | Y |
| J-13 | HighSpeed response input selection | 0: Communication<br>1: Analog input (2)(AIN2) | 0 | — | N |
| J-14 | Date/Time data selection from communication | 0: without date/time data<br>1: with date/time data | 0 | — | N |
| J-15 | Connected number of outside DB(Dynamic Brake) units with communication | 0～6 | 0 | — | Y |

*1: J-00=6 is for a future extension option. Under normal conditions, please do not use this setting.

*2: J-02=4 is for factory adjustment. Under normal conditions, please stay on the factory setting.

## 3.12. L-area (Input gain, output gain setting area)

Rewritable when in operation: Y = Yes N = No

| Console display | Set-up items | Set-up range (item selection) | Default setting | Unit | Rewritable |
|---|---|---|---|---|---|
| L-00 | Vdc detection gain | 80.0 to 120.0 | 100.0 | % | N |
| L-01 | Analog input(1) gain | 50.00 to 150.00 | Adjusted | % | Y |
| L-02 | Analog input(1) offset | -50.00 to 50.00 | Adjusted | % | Y |
| L-03 | Analog output(1) gain | 50.0 to 150.0 | Adjusted | % | Y |
| L-04 | Analog output(1) offset | -50.0 to 50.0 | Adjusted | % | Y |
| L-05 | Analog input(2) gain | 50.00 to 150.00 | 100.00 | % | Y |
| L-06 | Analog input(2) offset | -50.00 to 50.00 | 0.00 | % | Y |
| L-07 | Analog input(3) gain | 50.00 to 150.00 | 100.00 | % | Y |
| L-08 | Analog input(3) offset | -50.00 to 50.00 | 0.00 | % | Y |
| L-09 | Analog output(2) gain | 50.0 to 150.0 | 100.0 | % | Y |
| L-10 | Analog output(2) offset | -50.0 to 50.0 | 0.0 | % | Y |
| L-11 | Analog output(3) gain | 50.0 to 150.0 | 100.0 | % | Y |
| L-12 | Analog output(3) offset | -50.0 to 50.0 | 0.0 | % | Y |
| L-13 | Analog input(4) gain | 50.00 to 150.00 | 100.00 | % | Y |
| L-14 | Analog input(4) offset | -50.00 to 50.00 | 0.00 | % | Y |
| L-15 | Analog input(5) gain | 50.00 to 150.00 | 100.00 | % | Y |
| L-16 | Analog input(5) offset | -50.00 to 50.00 | 0.00 | % | Y |
| L-17 | Analog output(4) gain | 50.0 to 150.0 | 100.0 | % | Y |
| L-18 | Analog output(4) offset | -50.0 to 50.0 | 0.0 | % | Y |
| L-19 | Analog output(5) gain | 50.0 to 150.0 | 100.0 | % | Y |
| L-20 | Analog output(5) offset | -50.0 to 50.0 | 0.0 | % | Y |
| L-21*1 | Inverter operation mode monitor | SnPL (SIMPLE mode)<br>FuLL (FULL mode) | SnPL | — | N |

*1: Inverter operation mode monitor (L-21) is available only for indication.

## 3.13. n-area (monitor adjusting area)

Rewritable when in operation: Y = Yes N = No

| Console display | Set-up items | Set-up range (item selection) | Default setting | Unit | Rewritable |
|---|---|---|---|---|---|
| n-00 | Inverter control mode | o: Induction motor V/f mode<br>V: Induction motor vector mode<br>E: ED motor vector mode | o | — | N |
| n-01 | Capacity / Voltage class | 2r222 to 9022<br>2r244 to 31544 | Equivalent to rating of inverter | — | N |

Note: n-area is available only for displaying contents of setting items.
Rewrite of contents can be done by rewriting of inverter mode, capacity or voltage class of S-area. For the detail of S-area, please refer to Chapter3 3.16 S-area <Mode selection, analog input/output adjusting area>, also chapter4 4.16 S-area <Mode selection, analog input/output adjusting area>.

## 3.14. o- area (Factory adjustment area)

Rewritable when in operation: Y = Yes N = No

| Console display | Set-up items | Set-up range (item selection) | Default setting | Unit | Rewritable |
|---|---|---|---|---|---|
| o-00 | SpecialAdjustment | 0 to 65535 | 0 | — | Y |
| o-01 | SpecialAdjustment | 0 to 65535 | 0 | — | Y |
| o-02 | SpecialAdjustment | 0 to 65535 | 0 | — | Y |
| o-03 | SpecialAdjustment | 0 to 65535 | 0 | — | Y |
| o-04 to o-53 | SpecialAdjustment | These are for factory adjustment. Please stay on the factory default value. | — | — | — |

Note: o-area is for factory adjusting and special purpose, so that cannot be changed. No indication is displayed on the console monitor. Please stay on the factory default setting. (Error will be indicated if you attempt to write in this area.)

## 3.15. P-area (Built-in PLC, P resistor setting area)

Rewritable when in operation: Y = Yes N = No

| Console display | Set-up items | Set-up range (item selection) | Default setting | Unit | Rewritable |
|---|---|---|---|---|---|
| P-00 to 99 | P-resister constant setting | See separate booklet "User manual for VF66series PC Tool". | — | — | — |

## 3.16. S-area (Mode selection, analog input/output adjusting area)

**Rewritable when in operation: Y = Yes N = No**

| Console display | Set-up items | Set-up range (item selection) | Default setting | Unit | Rewritable |
|---|---|---|---|---|---|
| S-00 | Special mode selection | 1: Inverter initialization<br>2: Inverter mode change<br>3: Delete protection related<br>4: Switching between SIMPLE mode and FULL mode<br>12: DC mode auto-tuning (forward)<br>13: DC mode auto-tuning (reverse)<br>99: Inverter initialization(For factory adjustment) *1<br>101: Data transfer to SET66EX-Z<br>102: Data copy (exclude A-area) from SET66EX-Z)<br>103: Data copy (include A-area) from SET66EX-Z<br>104: Data comparison with SET66EX-Z | — | — | Y |
| S-01 | Cumulative operation timer (1) clear | 1: Clearing Timer (1) | — | — | Y |
| S-02 | Cumulative operation timer (2) clear | 1: Clearing Timer (2) | — | — | Y |
| S-03 | Vdc adjustment | Vdc value (V): Vdc detect gain adjust | — | — | N |
| S-04 | ROM rewrite enabling switch*2 | Rewriting of ROM will be possible by entering "1040" after the power is on. | — | — | N |
| S-05 | — | — | — | — | N |
| S-06 | Analog input (1) adjust | 1: Analog input (1) offset adjustment<br>Input analog input (1) voltage (V) ×1000:<br>Analog input (1) gain adjustment | — | — | N |
| S-07 | Analog output (1) adjust | 1: Analog output (1) offset adjustment<br>2: Analog output (1) gain adjustment | — | — | N |
| S-08 | Analog input (2) adjust | 1: Analog input (2) offset adjustment<br>Input analog input (2) voltage (V) ×1000:<br>Analog input (2) gain adjustment | — | — | N |
| S-09 | Analog output (2) adjust | 1: Analog output (2) offset adjustment<br>2: Analog output (2) gain adjustment | — | — | N |
| S-10 | Analog input (3) adjust | 1: Analog input (3) offset adjustment<br>Input analog input (3) voltage (V) ×1000:<br>Analog input (3) gain adjustment | — | — | N |
| S-11 | Analog output (3) adjust | 1: Analog output (3) offset adjustment<br>2: Analog output (3) gain adjustment | — | — | N |
| S-12 | Analog input (4) adjust | 1: Analog input (4) offset adjustment<br>Input analog input (4) voltage (V) ×1000:<br>Analog input (4) gain adjustment | — | — | N |
| S-13 | Analog output (4) adjust | 1: Analog output (4) offset adjustment<br>2: Analog output (4) gain adjustment | — | — | N |
| S-14 | Analog input (5) adjust | 1: Analog input (5) offset adjustment<br>Input analog input (5) voltage (V) ×1000:<br>Analog input (5) gain adjustment | — | — | N |
| S-15 | Analog output (5) adjust | 1: Analog output (5) offset adjustment<br>2: Analog putout (5) gain adjustment | — | — | N |
| S-16 | For factory adjustment | | — | — | Y |

Note: For the setting of S-area, first write "1040" followed by entering the function selection item within 60 second.

*1: Under normal conditions, please do not use this setting.

*2: In order to transfer the program of PLC function into ROM, ROM rewrite enabling switch is needed to be (S-04) = 1.
For detail of PLC function, please refer to <User manual for VF66 series PC Tool>.

# Chapter 4 Description of V/f mode parameter

Parameters for Induction motor V/f mode are described for each item in each area.

## 4.1. Basic set-up area

In the basic set-up area, most often used basic set-up items for the operation of inverter are concentrated. In this area, frequency setting, normal acceleration / deceleration time adjustment and etc can be set from the console.

Operation frequency setting

| Display | Items | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| 0.FrEF | Frequency command | - Maximum frequency (A-00) to Maximum frequency (A-00) | 0.1 | 0.5 | Hz |
| 1.FJoG | Forward JOG frequency | Minimum frequency (A-01) to 30.0 | 0.1 | 1.0 | Hz |
| 2.rJoG | Reverse JOG frequency | -30.0 to - Minimum frequency (A-01) | 0.1 | -1.0 | Hz |

Frequency command (0.FrEF):

Operation frequency can be set from the console. Select "Console" as a Commanding place when coupled (b-09), and so that effective when either "Coupled" or "console" is selected for the Frequency commanding place selection (b-10). See Chapter4 4.3 <b-area> for more detail.

Forward / Reverse JOG frequency (1.FJoG/ 2.rJoG):

Set-up Jog frequency for forward and reverse rotations.

Acceleration / deceleration time set-up

| Display | Items | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| 3.Acc1 | Acceleration time(1) | 0.0 to 3600.0 | 0.1 | 30.0 | sec |
| 4.dEc1 | Deceleration time(1) | 0.0 to 3600.0 | 0.1 | 30.0 | sec |
| 5.Acc2 | Acceleration time(2) | 0.0 to 3600.0 | 0.1 | 0.3 | sec |
| 6.dEc2 | Deceleration time(2) | 0.0 to 3600.0 | 0.1 | 0.3 | sec |

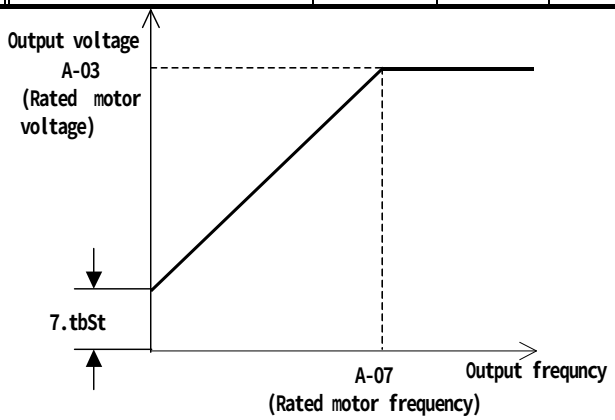
Set-up the acceleration time from 0 to the Maximum frequency (A-00) and the deceleration time from the maximum frequency to 0. VF66B has four different acceleration / deceleration time settings (in case of acceleration / deceleration (3) and (4), d-02 through d-05), each setting can be set or switched from outside by the multi-function input. (In the factory default, Acceleration / Deceleration time(1)(3.Acc1、4.dEc1) is selected for normal operation, and Acceleration / Deceleration time(2)(5.Acc2、6.dEc2) for Jog operation. Please refer to Chapter4 4.5 <d-area> for more detail.)

**Torque boost amount setting**

| Display | Item | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| 7.tbSt | Torque boost amount | 0.0 to 20.0 | 0.1 | 0.0 | % |

Set the boost voltage when manual boost is selected as a ratio relative to the Rated motor voltage (A-03).
If starting torque is inadequate, starting current can be increased and starting torque can be boosted by setting larger value to this setting. (For more information, please refer to Chapter4 4.6 E-area <Boost mode selection (E-05)>, also <V/f pattern selection (E-07)>.)

Note: This function is not available when Auto-boost is selected.




Torque boost characteristics

**DC brake amount setting**

| Display | Item | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| 8.dCbr | DC brake voltage | 0.0 to 100.0 | 0.1 | 0.0 | % |

Set the voltage when DC brake is activated as a ratio relative to the Rated motor voltage (A-03). If you want to increase braking effect by DC brake, then set the larger value to this setting. However, please note that if too much current is applied, overload protection may be activated. (For more information, please refer to Chapter4 4.3 b-area <DC brake duration (b-03)>.)

**Stabilizer (stabilizing adjustment) setting**

| Display | Item | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| 9.Stb | Stabilizer amount | 0.0 to 20.0 | 0.1 | 0.0 | % |

When the rotation of the motor becomes unstable, the rotation can be stabilized by adjusting this setting. Operate the motor at the frequency where the rotation becomes unstable, and gradually increase the stabilizer amount until the rotation becomes stabilized. (Please note that setting of too large value to this setting makes the rotation unstable.)

## 4.2. A-area (Motor max. rotation speed, motor rating, parameter set-up areas)

A-area is the set-up area for the motor parameter necessary for VF66B inverter to control the motor. Please be sure to set parameters in accordance with specification of the motor or the system before the operation of VF66B. Moreover, items A-11 through A-17 can be set automatically by automatic tuning. Combine the inverter with the motor, and carry on an automatic tuning to set the data to items A-11 through A-17 before the practical operation. Please refer to Chapter1 1.4 <Automatic tuning> for more detail of automatic tuning.

Maximum and Minimum frequency settings of motor

| Display | Items | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| A-00 | Maximum frequency | 15.0 to 400.0 | 0.1 | 60.0 | Hz |
| A-01 | Minimum frequency | 0.0 to 10.0 | 0.1 | 0.5 | Hz |

The maximum frequency (A-00) sets the maximum frequency (absolute value) of the motor for operation. Inverter uses this setting as 100% (reference) to control motor speed. Please set the maximum frequency the value greater than rated frequency of the motor.

The Minimum frequency (A-01) sets the minimum frequency of the motor for operation. Inverter will limit the frequency command to this setting value if the frequency command is less than the absolute value of this setting. If "Minimum frequency start" is selected for the Start mode selection (E-02) (Chapter4 4.6 E-area), the output frequency will be started from this frequency.

Setting of the indicated value on motor's rating plate

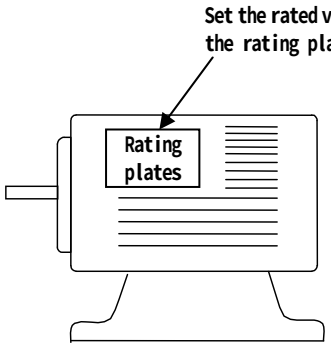
| Display | Items | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| A-02 | Rated motor capacity | 0 to inverter rated capacity*1 | Note 1 | Inverter rate | kW |
| A-03 | Rated motor voltage | (200V class) 70 to 230<br>(400V class) 140 to 460 | 1 | 200<br>400 | V |
| A-04 | Rated motor current | 20 to 150% of inverter rated current | Note 1 | Inverter rate | A |
| A-05 | Rated motor speed | 400 to 24000 | 1 | 1760 | r/min |
| A-06 | Number of motor pole | 2 to 12 | — | 4 | Pole |
| A-07 | Rated motor frequency | 15.0 to Maximum frequency (A-00) | 0.1 | 60.0 | Hz |

*1: If rated voltage of the motor is larger than 190V (200V class) / 380V (400V class), the maximum value of the setting range will be proportionally larger.

Note 1: Setting resolution may differ in inverter type.

Set the rated value stated in the rating plates or data sheets to items A-02 through A-07. These settings are necessary for operation of the motor or for automatic tuning and therefore they must be set prior to automatic tuning. An example of a motor rating plate is shown in the right figure. If the motor has dual rating on its rated voltage and rated current, set larger values to Rated motor voltage (A-03) and Rated motor current (A-04) within the intended speed range.

V/f characteristic will be that output voltage becomes the Rated motor voltage (A-03) when the output frequency becomes the Rated motor frequency (A-07). Output voltage becomes constant with the Rated motor voltage (A-03) if the output frequency is greater than the Rated motor frequency (A-07).



Motor rating plate

**PWM carrier frequency setting**

| Display | Item | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| A-09 | PWM carrier frequency | 1.0 to 6.0 | 0.1 | 2.0 | kHz |

The modulation carrier frequency of the inverter's voltage output PWM.

**Items set by automatic tuning (Dead time compensation for IGBT of the inverter, primary resistance of the motor)**

*** Following items (A-11 through A-17) are the data set by automatic tuning. Please refer to Chapter1 1.4 <Automatic tuning> for more information.**

| Display | Items | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| A-11 | DeadTime compensation(U phase+) | 0.00 to 9.99 | 0.01 | Depend on inverter rate*1 | μsec |
| A-12 | DeadTime compensation(U phase-) | 0.00 to 9.99 | 0.01 | Depend on inverter rate*1 | μsec |
| A-13 | DeadTime compensation(V phase+) | 0.00 to 9.99 | 0.01 | Depend on inverter rate*1 | μsec |
| A-14 | DeadTime compensation(V phase-) | 0.00 to 9.99 | 0.01 | Depend on inverter rate*1 | μsec |
| A-15 | DeadTime compensation(W phase+) | 0.00 to 9.99 | 0.01 | Depend on inverter rate*1 | μsec |
| A-16 | DeadTime compensation(W phase-) | 0.00 to 9.99 | 0.01 | Depend on inverter rate*1 | μsec |
| A-17 | Motor primary resistance | ( Setting range and setting resolution may differ depend on inverter capacity*1) | Depend on inverter rate*1 | Depend on inverter rate*1 | mΩ |

***1: Factory default values for A-11 through A-17 and setting range of A-17 are depend on inverter type as following table.**

Table:A-11 to A-17 shipment value and A-17 setting area

| Inverter type | A-11 to A-16 Shipment value | A-17 Shipment value | A-17 Setting area | Inverter type | A-11 to A-16 Shipment value | A-17 Shipment value | A-17 Setting area |
|---|---|---|---|---|---|---|---|
| 2R222 | 4.00 | 626 | 1 to 65535 | 2R244 | 4.00 | 2566 | 1 to 65535 |
| 3R722 | 4.00 | 469.9 | 0.1 to 6553.5 | 3R744 | 4.00 | 1880 | |
| 5R522 | 4.00 | 228.8 | | 5R544 | 4.00 | 915 | |
| 7R522 | 4.00 | 186.8 | | 7R544 | 4.00 | 747.3 | 0.1 to 6553.5 |
| 1122 | 2.80 | 94.0 | | 1144 | 2.80 | 376.0 | |
| 1522 | 2.80 | 76.6 | | 1544 | 2.80 | 306.0 | |
| 2222 | 2.80 | 34.00 | 0.01 to 655.35 | 2244 | 2.80 | 136.0 | |
| 3044 | 2.80 | 25.80 | | 3044 | 2.80 | 103.2 | |
| 3744 | 2.80 | 20.10 | | 3744 | 2.80 | 80.4 | |
| 4544 | 2.80 | 15.40 | | 4544 | 2.80 | 61.50 | 0.01 to 655.35 |
| 5544 | 2.80 | 10.80 | | 5544 | 2.80 | 43.30 | |
| 7522 | 2.80 | 7.00 | | 7544 | 2.80 | 28.00 | |
| 9022 | 2.80 | 5.30 | | 11044 | 2.80 | 14.60 | |
| 15022 | 2.80 | 2.812 | 0.001 to 65.535 | 16044 | 2.80 | 7.80 | |
| 18022 | 2.80 | 1.743 | | 20044 | 2.80 | 6.20 | |
| | | | | 25044 | 2.80 | 4.92 | |
| | | | | 31544 | 2.80 | 3.33 | |
| | | | | 40044 | 2.80 | 2.633 | 0.001 to 65.535 |
| | | | | 50044 | 2.80 | 1.782 | |
| | | | | 60044 | 2.80 | 1.206 | |
| | | | | 75044 | 2.80 | 0.820 | |
| | | | | 100044 | 2.80 | 0.645 | |

In order to calculate precise output voltage to be used for control calculation, the dead time compensation at the IGBT device of each phase in the inverter is set to A-11 through A-16. Six separate dead time compensation are provided for the devises on +side and -side of each U, V and W phases. Set (Motor primary resistance) + (Wiring resistance between inverter and motor) to the motor primary resistance (A-17).

In initialization data, typical value is set in accordance with inverter capacity. Therefore, the motor is operable with initialization data, however, automatic tuning is highly recommended for more precise operation.

## 4.3. b-area (Operation mode, operation sequence setting area)

**Setting data rewrite protection**

| Display | Items | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| b-00 | Setting data rewrite protection | OFF (Inactive)<br>ON (Activate protection) | — | OFF | — |

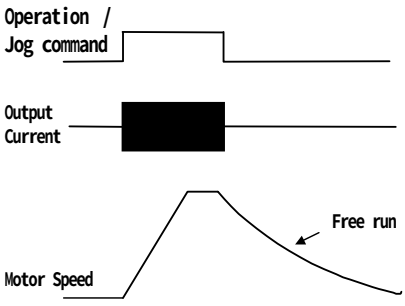
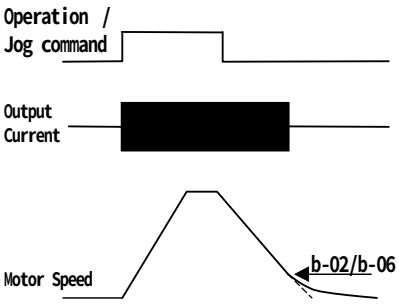
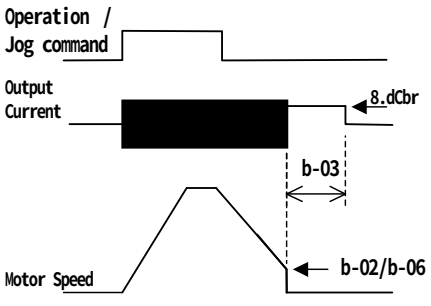
When the Setting data rewrite protection (b-00) is turned on, the data changed by SET66-Z or others will not be accepted. If data change is needed, please turn-off the Setting data rewrite protection (b-00).

* Any attempt to rewriting data when b-00 is turned on will result in indication of on the console panel.

**Stop mode selection**

| Display | Items | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| b-01 | Stop mode selection | 0: Free stop<br>1: Deceleration stop<br>2: Deceleration stop with DC brake | — | 1 | — |
| b-02 | Stop frequency | 0.0 to 30.0 | 0.1 | 1.0 | Hz |
| b-03 | DC brake operation time | 0.0 to 10.0 | 0.1 | 0.0 | sec |
| b-04 | — | — | — | — | — |
| b-05 | JOG stop mode selection | 0: Free stop<br>1: Deceleration stop<br>2: Deceleration stop with DC brake | — | 0 | — |
| b-06 | JOG stop frequency | 0.0 to 10.0 | 0.1 | 0.0 | Hz |

Stop mode selection (b-01) and JOG stop mode selection (b-05) set the operation selection when Operation command / jog command is turned OFF.

| Free stop | Deceleration stop | Deceleration stop with DC brake |
|---|---|---|
| Voltage output is stopped when Operation command / Jog command is turned off. | Voltage output is stopped after deceleration to the setting of the Stop frequency (b-02) / JOG stop frequency (b-06) in accordance with deceleration time. | DC brake is activated for the time set by the DC brake duration (b-03) after deceleration to the setting of the Stop frequency (b-02) / JOG stop frequency (b-06) in accordance with deceleration time.<br>Electric current during DC brake is adjusted in the DC brake voltage (8.dcbr) in basic set-up area. |
|  |  |  |

**Operation selection for Instantaneous power interruption restart**

| Display | Item | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| b-07 | Instantaneous power interruption restart | OFF (Inactive)<br>ON (Active) | — | OFF | — |

Instantaneous power interruption is the period between fall of DC voltage (Vdc) to the voltage below the specified value and recovery of the DC voltage to the voltage above the specified value without causing failure in control power. In this area, select the process after the recovery of power when the operation is suspended due to instantaneous power interruption.

OFF: In this setting, operation will not resumed even though power is recovered (inverter stays on stop). To resume operation, it is necessary to turn-off the Operation command (Jog command) once, and then turn-on the command again.

ON: In this setting, operation is automatically resumed after the recovery of the power. On condition that the operation is commanded by the contact signal or by the digital communication option, the operation command to the inverter must stay ON. Start-up jam protection (StrF) will be activated if the operation cannot resumed with the operation command to the inverter is stayed ON, after the suspension of the operation.

**Reverse prohibition mode selection**

| Display | Item | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| b-08 | Reverse prohibition mode selection | 0: Normal<br>1: Prohibition of nonconforming rotation against command<br>2: Reverse prohibition | — | 0 | — |

Prohibits reverse rotation.

Normal (b-08=0):

This is normal operation. No limitation on both forward and reverse rotations.

Prohibition of nonconforming rotation against command (b-08=1):

Prohibits reverse rotation against the operation command at the inverter start-up. Once the motor is started, it keeps prohibition against the reverse rotation to the operation command made at the time of inverter start-up until the inverter is turned off. Even if the forward rotation command is switched to the reverse rotation command after the start-up, the prohibition will not change unless otherwise the inverter is turned off.

| | Speed command to + | Frequency command to − |
|---|---|---|
| Start at forward | Forward operation | Limit to +minimum frequency |
| Start at reverse | Reverse operation | Limit to −minimum frequency |

Reverse rotation prohibition (b-08=2):

Regardless of the direction of the operation command, it prohibits reverse rotation of the motor (assuming the direction of the rotation as forward rotation when the output voltage phase order of the inverter is U→V→W). Frequency command in reversed direction is limited to +minimum frequency.

**Command input place selection for frequency, operation and Jog commands**

| Display | Items | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| b-09 | Commanding place when coupled | 0: Terminal block<br>1: Console (SET66-Z)<br>2: Digital communication option | — | 1 | — |
| b-10 | Frequency commanding place selection | 0: Coupled<br>1: Analog input(1)[terminal block](AIN1)<br>2: Console (SET66-Z)<br>3: Digital communication option<br>4: Analog input(2)[terminal block for IO66-Z option or digital communication option](AIN2)<br>5: (For extension option)*1<br>6: Analog input(3)[IO66-Z option terminalblock](AIN3)<br>7: Built-in PLC | — | 0 | — |
| b-11 | Operation commanding place selection | 0: Coupled<br>1: Terminal block<br>2: Console (SET66-Z)<br>3: Digital communication option | — | 0 | — |
| b-12 | JOG commanding place selection | | — | 0 | — |

*1: b-10=5 is for a future extension option. Under normal conditions, please do not use this setting.

Select the commanding place of the frequency command, the operation command and the Jog command. These input places can be set as a batch by the setting of b-09 <Commanding place selection when coupled>. The input place for each command by combination the setting b-09 through b-12 is as follows:

| | | Commanding place when coupled (b-09) | | |
|---|---|---|---|---|
| | | 0: Terminal block | 1: Console | 2: Digital communication option |
| Frequency command (b-10) | 0: Coupled | VFC66-Z P board [AIN1] terminal | [0.FrEF] setting | Speed command by communication |
| | 1: Terminal block [AIN1] | VFC66-Z P board [AIN1] terminal | VFC66-Z P board [AIN1] terminal | VFC66-Z P board [AIN1] terminal |
| | 2: Console (SET66-Z) | [0.FrEF] setting | [0.FrEF] setting | [0.FrEF] setting |
| | 3: Digital communication option | Command by communication | Command by communication | Command by communication |
| | 4: Analog input(2) [ option](AIN2) | IO66-Z option, etc. | IO66-Z option, etc. | IO66-Z option, etc. |
| | 5: (For extension option)*1 | — | — | — |
| | 6: Analog input(3) [option](AIN3) | IO66-Z option | IO66-Z option | IO66-Z option |
| | 7: Built-in PLC | Built-in PLC | Built-in PLC | Built-in PLC |
| Operation command (b-11) | 0: Coupled | VFC66-Z P board<br>·[ST-F] terminal<br>·Set Multi-function input terminal as operation command [reverse] | Console key [START], [FOR/REV] | Operation command by communication |
| | 1: Terminal block | VFC66-Z P board<br>·[ST-F] terminal<br>·Set Multi-function input terminal as operation command [reverse] | VFC66-Z P board<br>·[ST-F] terminal<br>·Set Multi-function input terminal as operation command [reverse] | VFC66-Z P board<br>·[ST-F] terminal<br>· Set Multi-function input terminal as operation command [reverse] |
| | 2: Console (SET66-Z) | Console key [START],[FOR/REV] | Console key [START], [FOR/REV] | Console key [START], [FOR/REV] |
| | 3: Digital communication option | Operation command by communication | Operation command by communication | Operation command by communication |
| Jog command (b-12) | 0: Coupled | VFC66-Z P board Set Multi-function input terminal as Jog command [forward], [reverse] | Console key [JOG/→], [FOR/REV] | Jog command by communication |
| | 1: Terminal block | VFC66-Z P board Set Multi-function input terminal as Jog command [forward], [reverse] | VFC66-Z P board Set Multi-function input terminal as Jog command [forward], [reverse] | VFC66-Z P board Set Multi-function input terminal as Jog command [forward], [reverse] |
| | 2: Console (SET66-Z) | Console key [JOG/→], [FOR/REV] | Console key [JOG/→], [FOR/REV] | Console key [JOG/→], [FOR/REV] |
| | 3: Digital communication option | **Jog command by communication** | **Jog command by communication** | **Jog command by communication** |

***1: b-10=5 is for a future extension option. Under normal conditions, please do not use this setting.**

**When the terminal block is selected as a frequency commanding place, switching between the [0-±10] terminal block (voltage input of 0 to ±10V or 0 to +10V) and [4-20] terminal block (current input of 4 to 20mA) should be done by b-17 <Analog frequency command characteristic selection>. In the factory default, [0-±10] (voltage input 0 to +10V) is selected.**

**Torque limiter setting**

| Display | Items | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| b-13 | Powering torque limit | 0 to 150* | 1 | 150 | % |
| b-14 | Regenerative torque limit | -150 to 0* | 1 | -150 | % |

Torque limit in powering side and regenerative side can be set. If a torque command exceeds this setting, then torque will be limited to this setting value.

* The maximum (minimum) value for setting range varies up to 200% (-200%) depend on the rated current of the motor. If the motor corresponding to the capacity of inverter is used, set the value up to 150% (-150%) in normal conditions.

**Torque limiter function selection**

| Display | Items | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| b-15 | Powering torque limit usage selection | OFF (not use)<br>ON (use) | — | ON | — |
| b-16 | Regenerative torque limit usage selection | OFF (not use)<br>ON (use) | — | ON | — |

When Powering torque limit usage selection (b-15) and/or Regenerative torque limit usage selection (b-16) are/is ON, use or nonuse of torque limit on powering direction and/or regenerative direction can be selected. In this case, if set value(s) of the Powering torque limit (b-13) or Regenerative torque limit (b-14) exceeds the torque command value, output torque will be limited to these setting values.

**Characteristic setting of the analog speed command (VFC66-Z AIN1 terminal block)**

| Display | Items | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| b-17 | Analog frequency command characteristic selection | 0: 0 to ±10V (bipolar)<br>1: 0 to 10V (monopolar)<br>2: 4 to 20mA | — | 1 | — |
| b-18 | Analog frequency command upper limit frequency | Absolute value of Analog frequency command lower limit frequency (b-19) to 100.0 | 0.1 | 100.0 | % |
| b-19 | Analog frequency command lower limit frequency | -Analog frequency command upper limit speed (b-18) to Analog frequency command upper limit frequency (b-18) | 0.1 | 0.0 | % |

Note: Analog frequency command upper limit frequency (b-18) and Analog frequency command lower limit frequency (b-19) are set in % with respect to the Maximum frequency (A-00).

(For the frequency commanding place selection, please refer to b-09 < Commanding place when coupled> and b-10 < Frequency commanding place selection>.)

For b-17 < Analog frequency command characteristics selection>, select the frequency command input of either voltage input (bipolar or monopolar) or current input.

Note: When the Analog frequency command characteristic selection (b-17) = 2(4～20mA input) is selected, please turn-on the SW1 of the VFC66-Z P-board. When the Analog frequency command characteristic selection (b-17) = 0 or 1, please turn-off the SW1.

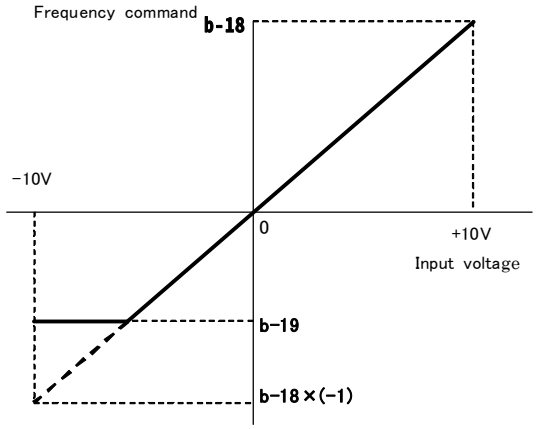
For the location of SW1, please refer to Chapter4 4.16 S-area for adjustment of Analog input (1) gain (L-01) when the input characteristic is 4 to 20mA.

**In case when the Analog input (1) terminal AIN1 is used for the frequency input of the VF66B**

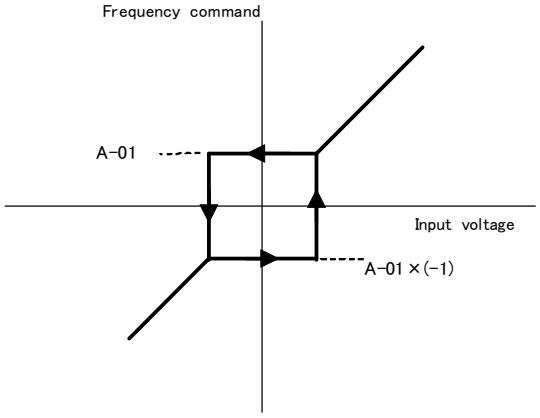
The characteristic of the frequency command input by the Analog input (1) is explained below.

**1) Voltage input (0 to ±10V) (b-17=0)**

In Analog frequency command characteristic selection b-17=0, rotation of the motor can be reversed by inputting negative voltage for the input voltage command. (In case if operation is made by reverse operation command, then the rotation will be reversed by inputting positive voltage and forward by inputting negative voltage). Analog commanding characteristic will be the setting of the Analog frequency command upper limit frequency (b-18) when inputting +10V, and the negative value of the Analog frequency command upper limit frequency (b-18) when inputting -10V. However, the negative side will be limited by the setting of the Analog frequency command lower limit frequency (b-19) and therefore in order to use the maximum in negative side, it is necessary to set -100% in the Analog frequency command lower limit frequency (b-19). When the Minimum frequency (A-01) is other than 0, it is limited so that the absolute value will not be less than this frequency. In this case, the characteristic when passing around 0V will be the hysteresis characteristic as shown in figure below. (Frequency at the start will be minimum frequency in both directions; forward if started with forward operation, and reverse if started with reverse operation.)




1-1) Voltage input when (0 to ±10V)



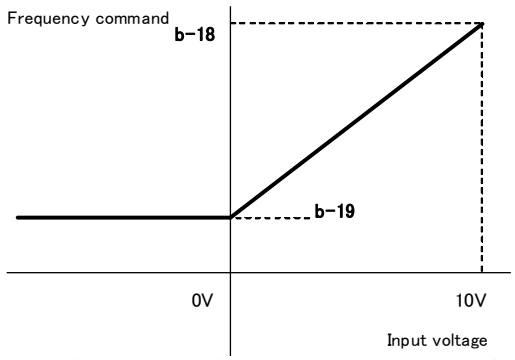

1-2) Minimum frequency (A-01) hysteresis characteristic around 0V

**2) Voltage input (0 to 10V) (b-17=1)**

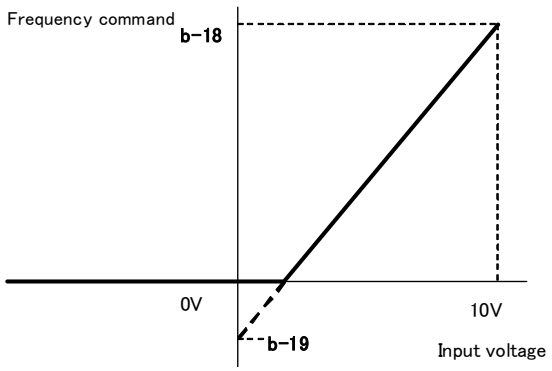
Analog commanding characteristic will be the setting of the Analog frequency command lower limit frequency (b-19) when inputting 0V, and the setting of the Analog frequency command upper limit frequency (b-18) when inputting 10V. However, this is only effective in the positive voltage, negative side will be limited to the setting of the Analog frequency command lower limit frequency (b-19) or 0 in the case when negative value is selected for the Analog frequency command lower limit frequency (b-19).

When the Minimum frequency (A-01) is other than 0, it is limited so that the absolute value will not be less than this frequency. As a frequency command, it is for forward rotation only and should use reverse operation command for reverse rotation.

V/fmode




2-1) 0 to 10V (when b-19 is 0 or more)

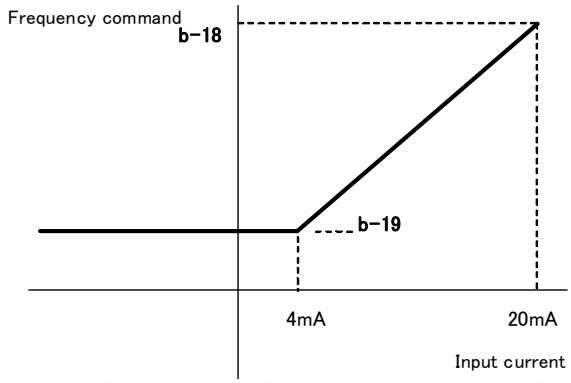



2-2) 0 to 10V (when b-19 is less than 0)

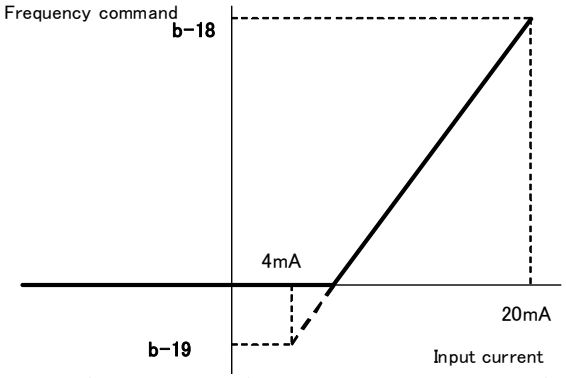
**3) Current input (4 to 20mA) (b-17=2)**

In Analog frequency command characteristics selection b-17=2, the characteristic will be setting of the Analog frequency command lower limit frequency (b-19) when inputting 4mA and setting of the Analog frequency command upper limit frequency (b-18) when inputting 20mA. However, this is only effective in the positive current, negative side will be limited to the setting of the Analog frequency command lower limit frequency (b-19) or 0 in the case when negative value is selected for the Analog frequency command lower limit frequency (b-19).

When the Minimum frequency (A-01) is other than 0, it is limited so that the absolute value will not fall below of this frequency. As a frequency command, it is for forward rotation only and should use reverse operation command for reverse rotation.




3-1) 4 to 20mA (when b-19 is 0 or more)




3-2) 4 to 20mA (when b-19 is less than 0)

**Analog input 0 limit function setting**

| Display | Item | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| b-20 | Analog_input_ZeroLimit_voltage | 0.000 to 1.000 | 0.001 | 0.000 | V |

This function forcibly turns the command to 0 when the absolute value of the command input voltage input in the Analog input (1) [AIN1] on the VFC66-Z P board is equal to or less than the value of this setting. This function can be used when 0 setting cannot be obtained even though 0v is set due to the causes such as drift in analog circuit.

**Analog output (1) characteristic selection (VFC66-Z AOT1 terminal block)**

| Display | Items | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| b-21 | Analog output(1) characteristic selection | 0: Output voltage<br>1: Output current<br>2: Torque command<br>3: Frequency<br>4: Frequency command<br>5: Built-in PLC output<br>6: Calibration<br>7: Internal monitor<br>-1: 6F frequency*1<br>-2: 6F speed*1<br>-3: 6F calibration*1 | — | 1 | — |

Select analog output data output to the location between the terminal blocks [AOT1] and [GND1] on the VFC66-Z P board.

*1: 6F means six times (6X) of the frequency signal. If "6F speed" (b-21=-2) or "6F calibration" (b-21=-3) is selected, then the sixfold signal of the frequency corresponding value is output. Gain or offset value of the 6F output may not be adjusted.

**Analog output selected by Analog output (1) 6F output characteristic selection (b-21)**

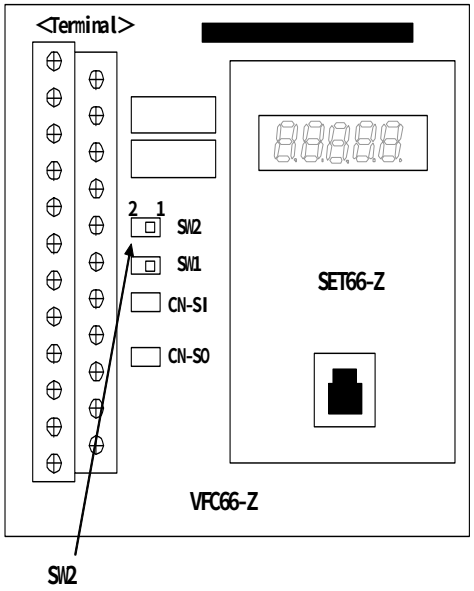
| | Items | Output voltage | | Item | Output voltage |
|---|---|---|---|---|---|
| 0 | Output voltage | 7.5V / 200V (200V class)<br>7.5V / 400V (400V class) | 4 | Frequency command (After accel/decel control) | 10V / Maximum frequency (A-00) |
| 1 | Output current | 5V / Inverter rated current | 5 | Built-in PLC output | 5V / 20000 (100%)* |
| 2 | Torque command | 5V / 100% | 6 | Calibration | Output 5V |
| 3 | Frequency | 10V / Maximum frequency (A-00) | 7 | Internal monitor | — |

* Please refer to the function manual of Control Block Editor for more detail.

**6F output selected by Analog output (1) 6F output characteristic selection (b-21)**

| | Items | 6F Output |
|---|---|---|
| -1 | 6F frequency | Outputs sixfold frequency signal of the output frequency. |
| -2 | 6F speed | Outputs sixfold frequency signal of the corresponding value of speed. |
| -3 | 6F calibration | Outputs sixfold frequency signal of the Maximum frequency (A-00) equivalent. |

Note: In order to output 6F output with the Analog output (1) characteristic, switch the SW2, shown in below figure, into "1" (Console panel side).




• In case motor speed (b-21=-2) is selected:

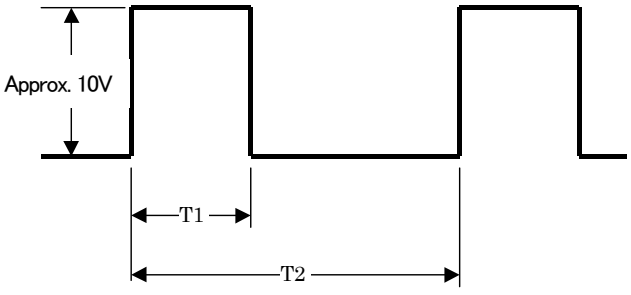
As shown in figure below, 6F signal (sixfold frequency signal of the frequency corresponding value) is output from the terminal block [AOT1]-[GND1].

When motor speed is selected, the frequency corresponding value F will be:

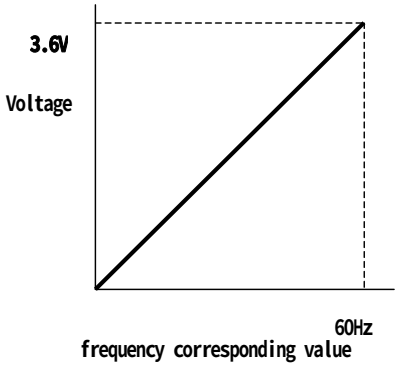
F = (motor speed)／60×(number of motor pole)／2(Hz)

• In case calibration (b-21=-3) is selected:

Sixfold frequency signal of the value equivalent to the Maximum frequency (A-00) is output. If digital counter type frequency/revolution indicator is used, set the pulse count in 1/6 circle. In case if DC voltmeter is used, the characteristic will be the average of 6F signal output as shown in figure below, so that adjust it accordingly. (Note: when the frequency corresponding value at the maximum speed F exceeds 120Hz, use the 1/2 of the value and when F exceeds 240Hz, then use the 1/4 of the value.)




6F signal output waveform
(Max. output current is 5mA)




Frequency—Voltage characteristic
(When F is 120Hz or less)

T1 and T2 in the figure are:

T1＝1msec (Frequency corresponding value at the maximum speed F is 120Hz or less)

＝0.5msec (Frequency corresponding value at the maximum speed F is 240Hz or less)

＝0.25msec(Frequency corresponding value at the maximum speed F exceeds 240Hz)

T2＝1/(6×F) F: output frequency or frequency corresponding value

## 4.4. c-area (Multi-function input related setting area)

**Input signal setting for the multi-function input**

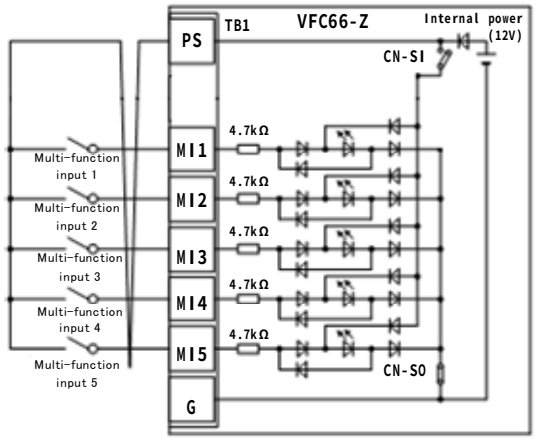
| Display | Items | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| c-00 | Multifunction input place selection | **0: Terminal block**<br>**1: Digital communication option** | — | 0 | — |
| c-01 | Multifunction input terminal(1) function selection | 0: Preset frequency selection 1<br>1: Preset frequency selection 2<br>2: Preset frequency selection 3<br>3: Accel./decel. time selection 1<br>4: Accel./decel. time selection 2<br>5: Frequency up command (MRH mode)<br>6: Frequency down command (MRH mode)<br>7: Frequency hold<br>8: S-pattern accel./decel. prohibition<br>9: Max. frequency reduction<br>10: Droop control disabled<br>11: No function<br>12: Forward/reverse operation command selection<br>13: DC brake command<br>**14: No function**<br>15: External failure signal 1 (protection relay 86A enabled)<br>16: External failure signal 2 (protection relay 86A enabled)<br>17: External failure signal 3 (protection relay 86A enabled)<br>18: External failure signal 4 (protection relay 86A enabled)<br>19: External failure signal 1 (protection relay 86A disabled)<br>20: External failure signal 2 (protection relay 86A disabled)<br>21: External failure signal 3 (protection relay 86A disabled)<br>22: External failure signal 4 (protection relay 86A disabled)<br>23: Trace back external trigger<br>24: 2nd set-up block selection<br>25: Emergency stop (B contact)<br>26: No function<br>27: Frequency commanding terminal block selection<br>28: No function<br>29: Operation command [reverse] (STARTR)<br>30: Jog command [forward] (JOGF)<br>31: Jog command [reverse] (JOGR)<br>32: Emergency stop (A contact)<br>33: Protection reset (RESET)<br>34: **External signal input 1**<br>35: **External signal input 2**<br>36: **External signal input 3**<br>37: **External signal input 4** | — | 29 | — |
| c-02 | Multifunction input terminal(2) function selection | | — | 30 | — |
| c-03 | Multifunction input terminal(3) function selection | | — | 31 | — |
| c-04 | Multifunction input terminal(4) function selection | | — | 32 | — |
| c-05 | Multifunction input terminal(5) function selection | | — | 33 | — |
| c-06 | Multifunction input terminal(6) function selection | | — | 0 | — |
| c-07 | Multifunction input terminal(7) function selection | | — | 1 | — |
| c-08 | Multifunction input terminal(8) function selection | | — | 2 | — |
| c-09 | Multifunction input terminal(9) function selection | | — | 3 | — |
| c-10 | Multifunction input terminal(10) function selection | | — | 4 | — |
| c-11 | Multifunction input terminal(11) function selection | | — | 5 | — |
| c-12 | Multifunction input terminal(12) function selection | | — | 6 | — |
| c-13 | Multifunction input terminal(13) function selection | | — | 7 | — |
| c-14 | Multifunction input terminal(14) function selection | | — | 8 | — |
| c-15 | Multifunction input terminal(15) function selection | | — | 9 | — |
| c-16 | Multifunction input terminal(16) function selection | | — | 10 | — |
| c-17 | Multifunction input terminal(17) function selection | | — | 11 | — |

***1: Items 34 and 35 for c-01 through c-17 are for future extension options. Under normal conditions, please do not use these settings.**

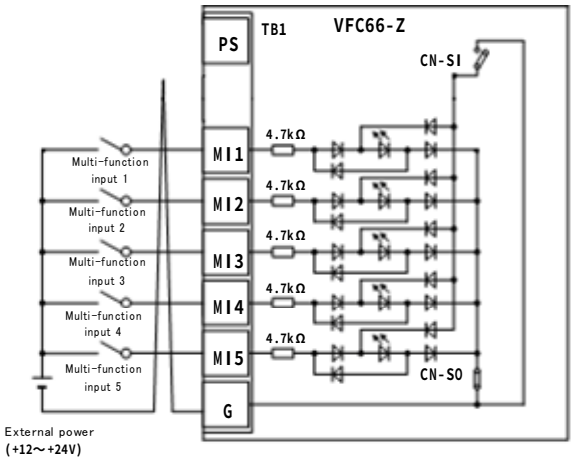
- Multi-function input terminals (1) – (5) are terminal blocks of [MI1] – [MI5] of the VFC66-Z respectively. Terminal blocks [MI6] – [MI17] of the Multi-function input terminals (6) – (17) are optional.
- When the Multifunction input place selection (c-00) is set to 1[Digital communication option], and when the setting values of the Multifunction input terminal function selection (c-01) – (c-17) are set to 0 (Preset speed selection 1) to 27 (Speed commanding terminal block selection), then motor will be controlled by the signal from the digital communication option. Therefore, functions of items 29 (Operation command [reverse]) to 33 (Protection reset) will be ineffective from the terminal block.

Note: If PLCL function usage selection (i-00) is turned ON, above settings are ignored and the Multi-function input terminal (1) – (5) (terminal blocks [MI1] – [MI5]) on the VFC66-Z P board and the Multi-function input terminal(6) – (17) (terminal blocks [MI6] – [MI17]) on the optional board will be the terminal for the input relay for the built-in PLC function. In this case, each function of the multi-function input will be controlled by the built-in PLC function. Moreover, if the PLCL function usage selection (i-00) is turned OFF and the PLCH function usage selection (i-01) is turned ON, then the Multi-function input terminal(4) ([MI4] terminal block) will be set to 32 (Emergency stop (A contact)) regardless of the setting of the Multifunction input terminal (4) function selection (c-04).

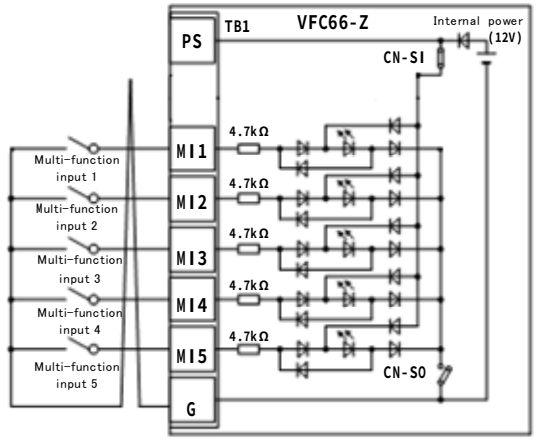
**Connection of Multi-function input terminal(1) – (5)**



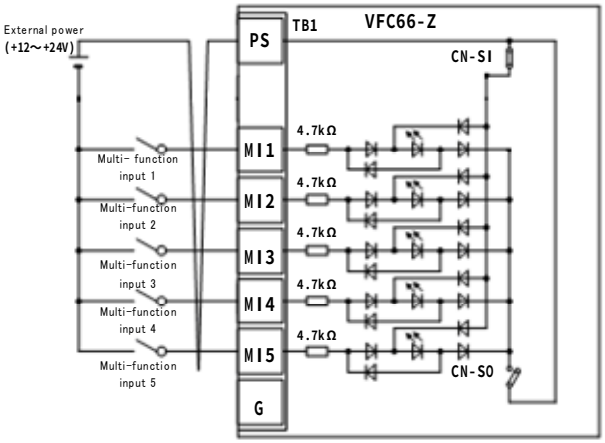

1.Source mode (with internal power source)




2.Source mode (with external power source)




3.Sink mode (with internal power source)




4.Sink mode (with external power source)

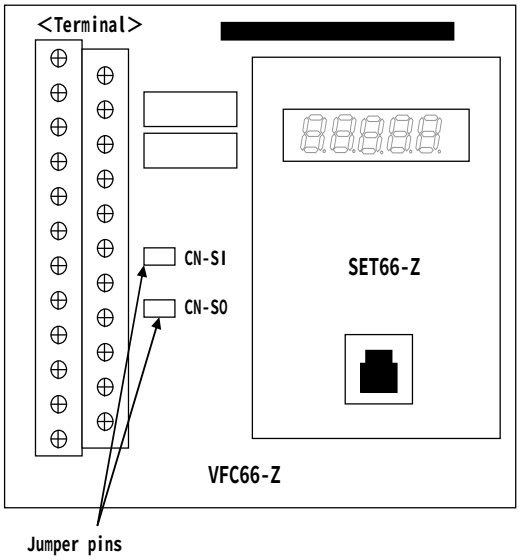
Above figures are showing typical connection of the multi-function input signal. **The maximum allowable voltage is 24V and the maximum allowable current per terminal is 3mA.**

Selection of either SOURCE mode or SINK mode is available for multi-function input signal, and either internal

power source of the inverter or external power source can be selected for each mode. In the factory default, it is set to SOURCE mode. Switching between SOURCE mode and SINK mode can be done by changing jumper socket of the VFC66-Z board.

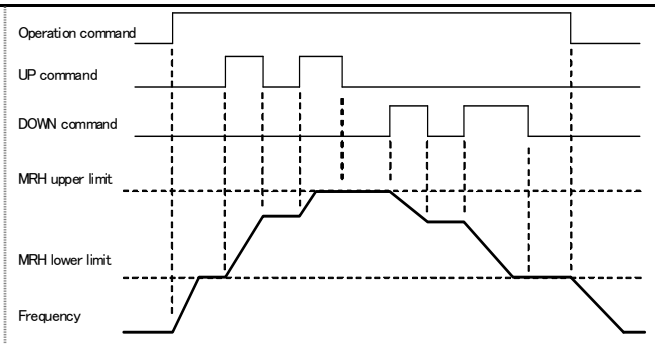
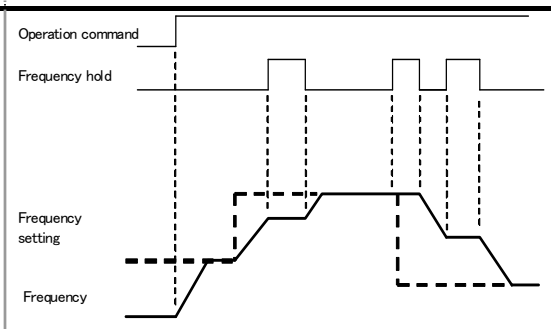
**CAUTION** [For your safety]

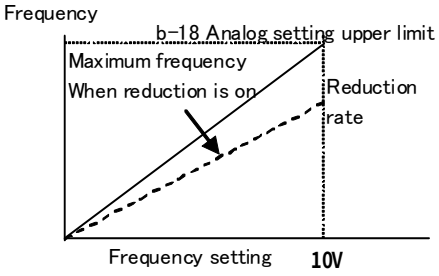
- Please make sure to turn-off the inverter before connecting terminals
  There is risk of electric shock.
- Please close the front cover before turning on the inverter to avoid risk of electric shock.
- Before you work on the jumper, please make sure to turn off the inverter.
  There is a possibility of electric shock, injury, or failure or malfunction in the equipment.




<Use of [CN-SO] jumper socket with internal power source>
Install a switch between the Multi-function terminals (1) – (5) (Terminals [MI1] - [MI5]) and [PS] terminal to turn ON/OFF.
<Use of [CN-SI] jumper socket with internal power source>
Install a switch between the Multi-function terminals (1) – (5) (Terminals [MI1] - [MI5]) and [GND1] terminal to turn ON/OFF.

**Detail of multi-function input setting**

<table>
<tr><th>No.</th><th>Items</th><th>Description</th></tr>
<tr><td>0 to 2</td><td>Preset frequency</td><td>By selecting one of three input of the preset frequency selection 1 – 3, you can utilize the setting of the preset frequency command 1 – 7 (d-15 – d-21).
<table>
<tr><th>Preset frequency 3</th><th>Preset frequency 2</th><th>Preset frequency 1</th><th>Frequency command</th></tr>
<tr><td>OFF</td><td>OFF</td><td>OFF</td><td>Standard selection (no preset)</td></tr>
<tr><td>OFF</td><td>OFF</td><td>ON</td><td>d-15 (preset frequency command 1)</td></tr>
<tr><td>OFF</td><td>ON</td><td>OFF</td><td>d-16 (preset frequency command 2)</td></tr>
<tr><td>OFF</td><td>ON</td><td>ON</td><td>d-17 (preset frequency command 3)</td></tr>
<tr><td>ON</td><td>OFF</td><td>OFF</td><td>d-18 (preset frequency command 4)</td></tr>
<tr><td>ON</td><td>OFF</td><td>ON</td><td>d-19 (preset frequency command 5)</td></tr>
<tr><td>ON</td><td>ON</td><td>OFF</td><td>d-20 (preset frequency command 6)</td></tr>
<tr><td>ON</td><td>ON</td><td>ON</td><td>d-21 (preset frequency command 7)</td></tr>
</table></td></tr>
<tr><td>3 and 4</td><td>Acceleration / deceleration time selection</td><td>Acceleration/deceleration time can be changed during operation by using the input of the Acceleration/deceleration time selection 1 – 2.<br>(When S-pattern acceleration/deceleration is used, the S-pattern acceleration/deceleration usage selection (d-06) is needed to be turned ON.)
<table>
<tr><th>Accel./Decel. time select 2</th><th>Accel./Decel. time select 1</th><th>Acceleration/deceleration time to be selected. (Includes S-pattern accel./decel.)</th></tr>
<tr><td>OFF</td><td>OFF</td><td>Standard (Accel./Decel. time selected in d-00)</td></tr>
<tr><td>OFF</td><td>ON</td><td>Accel./Decel. time (2) (5.Acc2, 6.dEc2 and d-11 to 14)</td></tr>
<tr><td>ON</td><td>OFF</td><td>Accel./Decel. time (3) (d-02, d-03 (w/o S-pattern))</td></tr>
<tr><td>ON</td><td>ON</td><td>Accel./Decel. time (4) (d-04, d-05 (w/o S-pattern))</td></tr>
</table></td></tr>
<tr><td>5 and 6</td><td>Frequency UP/DOWN command (MRH mode)</td><td>By turning the MRH function usage selection (d-27) ON and selecting terminal block for the frequency commanding place, acceleration/deceleration by UP/DOWN command becomes possible. If frequency exceeds its upper or lower limit, it will be automatically accelerated/decelerated to the upper or lower limit without having UP/DOWN command. Rotation can be reversed by setting negative value into the lower limit speed.<br> 
</td></tr>
<tr><td>7</td><td>Frequency hold</td><td>When this signal is turned on during acceleration/deceleration operation of the inverter, the inverter temporarily stops acceleration/deceleration and hold the frequency at that time. When the signal is turned off, the inverter resumes acceleration/deceleration.<br>( Note: Frequency hold is ineffective during deceleration stop by the stop command)<br> 
</td></tr>
<tr><td>8</td><td>S-pattern accel./decel. prohibition</td><td>S-pattern accel./decel. can be forcibly prohibited to obtain normal accel./decel. by turning on this signal even when S-pattern accel./decel. usage selection is turned on and during the S-pattern accel./decel. operation.</td></tr>
</table>

| No. | Items | Description |
|---|---|---|
| 9 | Maximum frequency reduction | If terminal block is selected as the frequency command input place, the frequency command will be reduced in accordance with the setting of the Maximum frequency reduction rate (H-12) by turning on this signal (see figure on the right). This signal can be turned ON/OFF when the motor is stopped. If this signal is turned ON/OFF when the motor is in operation, switching will not occurred until the motor is stopped once. (This function is only effective for the analog input from the terminal block)   |
| 10 | Droop control disabled | Even when the Droop function usage selection (i-02) is turned ON, droop control will be disabled by turning on this signal. For more information about droop control, please refer to Chapter3 3.10 <i-area> also Chapter4 4.10 <i-area>. |
| 12 | Forward/reverse operation command | When the Operation commanding place selection (b-11) is set to 1 (terminal block) or the Jog command input place selection is set to 1 (terminal block), the Operation command/Jog command can be switched between forward and reverse by turning ON this signal. (forward → reverse or reverse → forward)<br>* Because of the Operation commanding place selection (b-11) is set to 1, please install a switch between [ST-F] terminal and [PS] terminal of the VFC66-Z terminal block in order to turn ON/OFF the operation signal. For more information, please refer to the manual <Basic operation>. |
| 13 | DC brake command | Turning ON of this signal activates DC brake which allows DC current to flow into the motor. The current can be adjusted by the DC brake voltage (8. dcbr) in V/f mode. After this signal is turned OFF, the motor will be stopped after the duration set in the DC brake duration (b-03). If this signal and Operation/Jog command are input simultaneously, then Operation/Jog command will be prioritized. |
| 15 to 18 | External failure signal (protection relay 86A enabled) | Having a failure signal of peripheral equipment as an input of this signal, the inverter can be stopped for protection.<br>When the external failure signal 1 – 4 is turned ON, then inverter cuts its output and turns ON the protection relay 86A.<br>Simultaneously, [EF1] – [EF4] will appear on the console. Moreover, the trace back will be triggered by this signal. To cancel the protective operation, execute protective operation reset by pressing [STOP/RESET] key or by setting any of the multi-function input terminal to "protection reset" and then turn it ON. |
| 19 to 22 | External failure signal 1 (protection relay 86A disabled) | Same as above except the protection relay 86A will be ineffective. Also trace back will not be triggered by this signal. In this case, if all of the Operation/Jog/DC brake commands of the inverter are turned OFF, then protective operation will be released automatically. |
| 23 | Trace back external trigger | Normally, trace back is triggered when failure is occurred or when protective operation is activated, however, by inputting this signal, trace back can be triggered forcibly. For more information about trace back, please refer to Chapter3 3.7 <F-area> also Chapter4 4.7 <F-area>. |
| 24 | 2nd set-up block selection | When this signal is ON, each parameter set in the 2nd set-up block will be used.<br>ON<br>Parameter set at the 1st set-up block → Parameter set at the 2nd set-up block<br>Parameter set at the 2nd set-up block ← Parameter set at the 1st set-up block<br>OFF |
| 25 | Emergency stop (B contact) | Emergency stop signal on the B contact input makes the contact open and brings an emergency stop. (Therefore, care must be taken if this function is set into any of the terminal block, it makes emergency stop and cannot be operated unless otherwise close the contact.) |

| No. | Items | Description |
|---|---|---|
| 27 | Frequency commanding terminal block selection | Turning ON of this signal forcibly selects the terminal block (VFC66-Z[AIN1] terminal) as the frequency command input place regardless of the setting of the Frequency commanding place selection (b-10).<br>If this signal and Preset speed selection are input simultaneously, then this signal will be prioritized.<br><br>* If IO66-Z option or digital communication option is installed, it will be forcibly changed from the VFC66-Z [AIN1] terminal to the terminal block [AIN2] terminal for the IO66-Z option or the digital communication option regardless of the setting of the Digital communication option selection (J-00).<br>Note: When the Digital communication option selection (J-00) is set to 0 (OFF), protective function of the IO66-Z option or the digital communication option will not be activated. |
| 29 | Operation command [reverse] (STARTR) | With the setting of the Operation command input place selection (b-11) = 1(terminal block), the motor will be reversed when this signal is ON. |
| 30 | Jog command [forward](JOGF) | With the setting of the JOG commanding place selection (b-12) = 1(terminal block), it becomes Jog operation [forward] when this signal is ON. |
| 31 | Jog command [reverse] (JOGR) | With the setting of the JOG commanding place selection (b-12) = 1(terminal block), it becomes Jog operation [reverse] when this signal is ON. |
| 32 | Emergency stop (A contact) | Emergency stop signal on the A contact input makes the contact open and brings an emergency stop. |
| 33 | Protection reset (RESET) | Turning ON of this signal cancels the protective operation. |
| 34 to 37 | External signal input | According to using this function, VFC can transmit the signal from peripheral devices to another unit(master unit) through the optional digital communication board. (It is possible to use this function as a coil input of PLC.) |

## 4.5. d-area (Acceleration/deceleration time, frequency jump function, MRH function selection area)

**Selection and setting of acceleration/deceleration time**

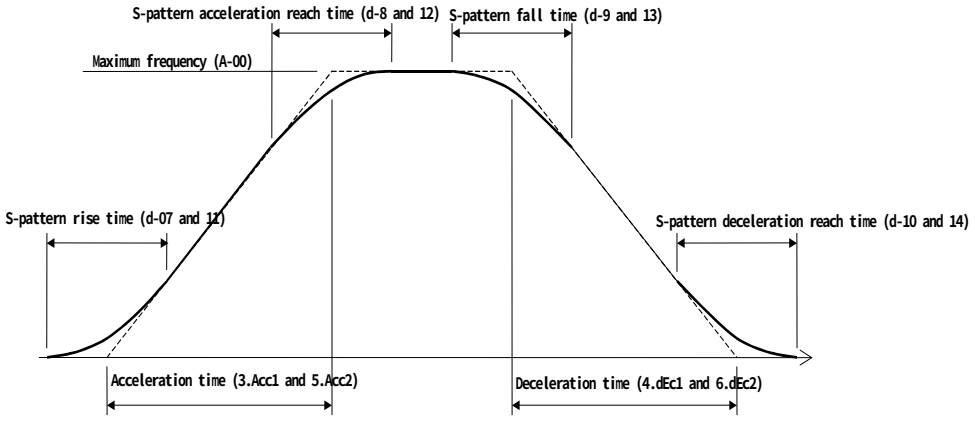
| Display | Items | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| d-00 | Acceleration/Deceleration time selection | 0: Acceleration/deceleration Time (1)<br>1: Acceleration/deceleration Time (2) | — | 0 | — |
| d-01 | JOG acceleration/deceleration time selection | 2: Acceleration/deceleration Time (3)<br>3: Acceleration/deceleration Time (4) | — | 1 | — |
| d-02 | Acceleration time(3) | 0.0 to 3600.0 | 0.1 | 30.0 | sec |
| d-03 | Deceleration time(3) | 0.0 to 3600.0 | 0.1 | 30.0 | sec |
| d-04 | Acceleration time(4) | 0.0 to 3600.0 | 0.1 | 30.0 | sec |
| d-05 | Deceleration time(4) | 0.0 to 3600.0 | 0.1 | 30.0 | sec |
| d-06 | S-pattern acceleration/deceleration usage selection | OFF (not use)<br>ON (use) | — | OFF | — |
| d-07 | S-pattern rise time(1) | 0.0 to 60.0 | 0.1 | 0.1 | sec |
| d-08 | S-pattern acceleration reach time(1) | 0.0 to 60.0 | 0.1 | 0.1 | sec |
| d-09 | S-pattern fall time(1) | 0.0 to 60.0 | 0.1 | 0.1 | sec |
| d-10 | S-pattern deceleration reach time(1) | 0.0 to 60.0 | 0.1 | 0.1 | sec |
| d-11 | S-pattern rise time(2) | 0.0 to 60.0 | 0.1 | 0.1 | sec |
| d-12 | S-pattern acceleration reach time(2) | 0.0 to 60.0 | 0.1 | 0.1 | sec |
| d-13 | S-pattern fall time(2) | 0.0 to 60.0 | 0.1 | 0.1 | sec |
| d-14 | S-pattern deceleration reach time(2) | 0.0 to 60.0 | 0.1 | 0.1 | sec |

Select an acceleration/deceleration time setting to be used in normal operation and Jog operation by the Acceleration/Deceleration time selection (d-00) and JOG acceleration/deceleration time selection (d-01) respectively.

**Please note that the acceleration/deceleration time setting for normal operation can be changed also from the multi-function input.**

| Setting of d-00 or d-01, or selection from multi-function input | Acceleration time | Deceleration time | S-pattern rise time | S-pattern accel. reach time | S-pattern fall time | S-pattern decel. reach time |
|---|---|---|---|---|---|---|
| 0:Accel/Decel time (1) | 3.Acc1 | 4.dEc1 | d-07 | d-08 | d-09 | d-10 |
| 1:Accel/Decel time (2) | 5.Acc2 | 6.dEc2 | d-11 | d-12 | d-13 | d-14 |
| 2:Accel/Decel time (3) | d-02 | d-03 | 0.0 | 0.0 | 0.0 | 0.0 |
| 3:Accel/Decel time (4) | d-04 | d-05 | 0.0 | 0.0 | 0.0 | 0.0 |

- **Acceleration time (1) (3.Acc1), Deceleration time (1) (4.dEc1), Acceleration time (2) (5.Acc2) and Deceleration time (2) are items of the basic set-up area.**
- **When acceleration/deceleration time (3) or (4) is selected, all of the S-pattern acceleration/deceleration time will be 0.0. Acceleration/deceleration time is acceleration/deceleration time between 0 speed and the maximum speed of the setting and the time for S-pattern curve as shown in the figure below. To use S-pattern acceleration/deceleration function, it is necessary to turn ON the S-pattern acceleration/deceleration usage selection (d-06). When the selection (d-06) is OFF, S-pattern acceleration/deceleration cannot be obtained even if time setting for the S-pattern acceleration/deceleration is set.**


S-pattern acceleration reach time (d-8 and 12)
S-pattern fall time (d-9 and 13)
Maximum frequency (A-00)
S-pattern rise time (d-07 and 11)
S-pattern deceleration reach time (d-10 and 14)
Acceleration time (3.Acc1 and 5.Acc2)
Deceleration time (4.dEc1 and 6.dEc2)

**Time chart of acceleration/deceleration (S-pattern accel./decel.)**

**Preset operation frequency command setting**

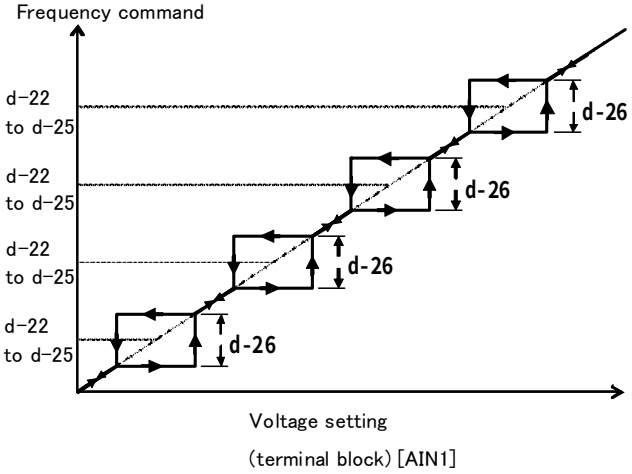
| Display | Items | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| d-15 | Preset frequency(1) | -Maximum frequency (A-00) to Maximum frequency (A-00) | 0.1 | 0.0 | Hz |
| d-16 | Preset frequency(2) | | 0.1 | 0.0 | Hz |
| d-17 | Preset frequency(3) | | 0.1 | 0.0 | Hz |
| d-18 | Preset frequency(4) | | 0.1 | 0.0 | Hz |
| d-19 | Preset frequency(5) | | 0.1 | 0.0 | Hz |
| d-20 | Preset frequency(6) | | 0.1 | 0.0 | Hz |
| d-21 | Preset frequency(7) | | 0.1 | 0.0 | Hz |

This is the frequency command setting of the preset operation function selected by the multi-function input signal. For more information on the preset operation selection by the multi-function input signal, please refer to Chapter3 3.4 <c-area (multi-function input related area)> also Chapter4 4.4 <c-area (multi-function input related area)>.

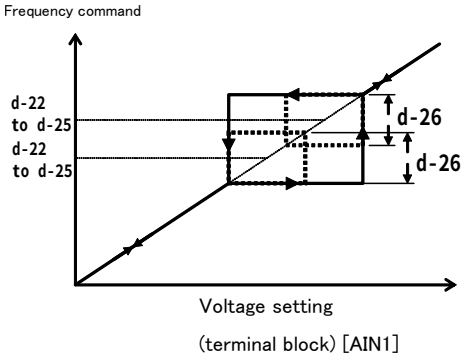
**Frequency command jump function setting**

| Display | Items | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| d-22 | Jump frequency(1) | 0.0 to Maximum frequency (A-00) | 0.1 | 0.0 | Hz |
| d-23 | Jump frequency(2) | | 0.1 | 0.0 | Hz |
| d-24 | Jump frequency(3) | | 0.1 | 0.0 | Hz |
| d-25 | Jump frequency(4) | | 0.1 | 0.0 | Hz |
| d-26 | Jump frequency width | 0.0 to 10.0 | 0.1 | 0.0 | Hz |

This function makes the frequency command to jump to avoid resonance point speed of the equipment. At the jump point, frequency command jumps as hysteresis S-pattern as shown in the figure below. It is necessary to make the frequency command for acceleration/deceleration control to jump, so that during acceleration/deceleration, jump width can be passed by the gradient obtained from the setting of acceleration/deceleration time.




Frequency command jump function



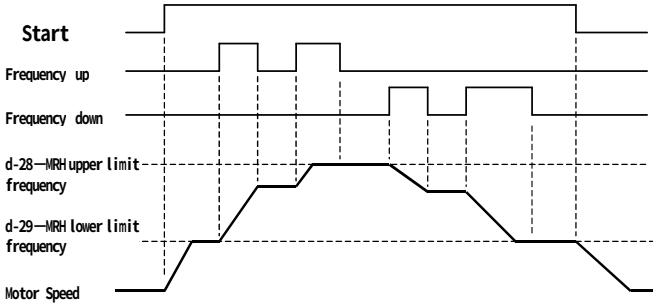

In case the area to be jumped is overlapped

MRH (acceleration/deceleration by a contact) mode setting

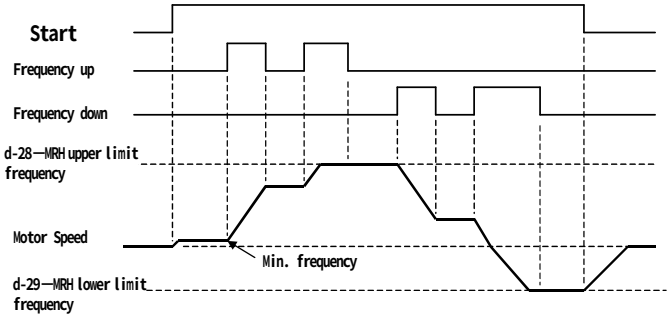
| Display | Items | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| d-27 | MRH function usage selection | OFF (not use)<br>ON (use) | — | OFF | — |
| d-28 | MRH upper limit frequency | MRH lower limit frequency (d-29) to Maximum frequency (A-00) | 0.1 | 5.0 | Hz |
| d-29 | MRH lower limit frequency | -Max. frequency to MRH upper limit frequency (d-28) | 0.1 | 0.0 | Hz |

By turning the MRH function usage selection (d-27) ON, acceleration/deceleration control can be made from the contact (MRH mode). When d-27 is turned ON, UP/DOWN of speed can be made from the multi-function input contact if the terminal block is selected as the operation command input place by the setting of the Commanding place when coupled (b-09) or the Frequency commanding place selection (b-10). For more information, please refer to Chapter3 3.4 <c-area (Multi-function input related area)> also Chapter4 4.4 <c-area (multi-function input related area)>. Rotation speed is accelerated toward the MRH upper limit frequency by the UP command and decelerated toward the MRH lower limit frequency by the DOWN command. If no command is input, or if both commands are input same time, then it keeps the speed at that time. In case if the frequency is not in the range between settings of the MRH upper limit frequency (d-28) and the MRH lower limit frequency (d-29), then it will be automatically accelerated or decelerated to the setting of the MRH upper limit frequency (d-28) or MRH lower limit frequency (d-29) respectively.

Rotation can be reversed by setting negative value into the MRH lower limit frequency (d-29).




When setting of MRH lower limit frequency is positive




When setting of MRH lower limit frequency is negative

Note: If the signal of the multi-function input preset frequency selection or the frequency command terminal block selection is input during the MRH mode, the frequency command of these signals are prioritized. For more information, please refer to Chapter3 3.4 <c-area (multi-function input related area)> and Chapter4 4.4 <c-area (multi-function input related area)>.

## 4.6. E-area (Frequency characteristics related setting area)

Regeneration stall prevention function setting

| Display | Items | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| E-00 | Regeneration stall prevention function usage selection | OFF (not use)<br>ON (use) | — | OFF | — |
| E-01 | Regeneration stall prevention voltage | (200V class) 320 to 360<br>(400V class) 640 to 720 | 1 | 340<br>680 | V |

In case if DC voltage rise exceeds the regeneration stall prevention voltage and during deceleration, deceleration is ceased once to prevent being trip by overvoltage protection operation (OV). When optional DB

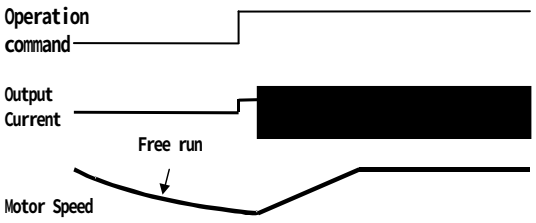
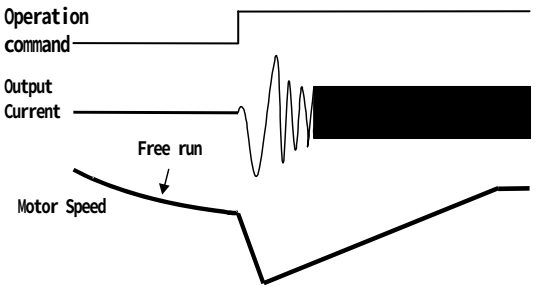
(dynamic brake) unit is used for this function, please set the regeneration stall prevention voltage of the function setting and the DB operation level of the unit same level.

**Start mode selection**

| Display | Items | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| E-02 | Start mode selection | 0: Free start<br>1: Minimum frequency start | — | 1 | — |
| E-06 | Restart delay time | 0.100 to 10.000 | 0.001 | 0.100 | sec |

Select a start mode in the Start mode selection (E-02). Also set the delay time between inverter stop and restart in the Restart delay time (E-06). Inverter will not restart until this time period is past even if operation signal is turned ON.

Note: When the motor with relatively large capacity is started, free start may be failed due to residual flux remained in the motor if restart is attempted just after inverter stop. In such case, set the longer delay time in the Restart delay time (E-06). If the inverter is turned OFF in the frequency of 1/10 or less of the maximum frequency, the inverter will be restarted from the minimum frequency even if free start is selected.

| Free start | Minimum frequency start |
|---|---|
| When operation command is turned ON during free rotation of motor, the motor will be started from the frequency synchronized with the motor speed. | Motor will start from the Minimum frequency (A-01) regardless of motor rotation. (In the instantaneous power interruption restart, motor will be restarted at the operation frequency at the time of power failure.) |
|  |  |

**Rotation direction change setting of the motor**

| Display | Item | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| E-03 | Forward direction change | OFF (Forward)<br>ON (Reverse) | — | OFF | — |

When the Forward direction change (E-03) is ON, the direction of the motor can be reversed without replacing the wirings of UVW phases.

If the Reverse prohibition mode selection (b-08) is set to 2 < Reverse prohibition> when the Forward direction change (E-03) is ON, it prohibits forward direction rotation.

**Simulation mode setting**

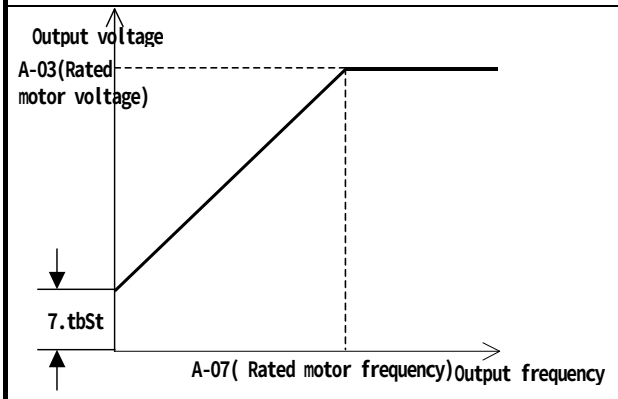
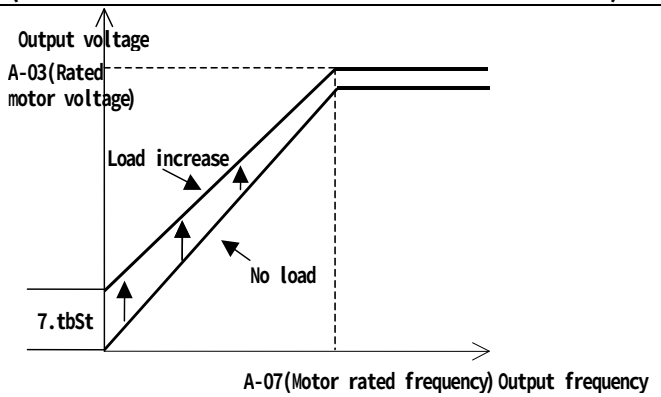
| Display | Item | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| E-04 | Simulation mode | OFF (without simulated operation)<br>ON (with simulated operation) | — | OFF | — |

When the Simulation mode (E-04) is ON, the inverter mode can be changed to the simulation mode. Simulation mode means that VF66B behaves to be virtually in operation mode without actually outputting voltage. In the simulation mode, inverter will not output any voltage from its operation, so that it is possible to carry out sequence check without running the motor connected to the VF66B.

Boost mode selection

| Display | Item | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| E-05 | Autoboost mode | OFF (Manual boost)<br>ON (Auto-boost) | — | OFF | — |

In V/f mode, inverter output can be boosted in accordance with the motor or load characteristics.
Following two boost modes can be selected:

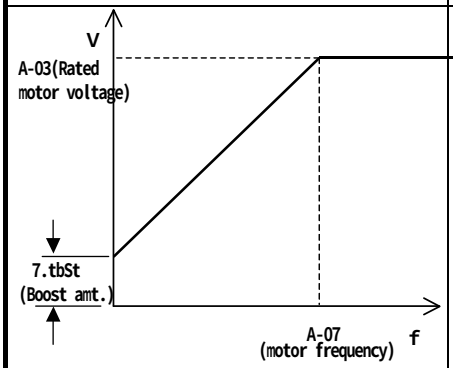
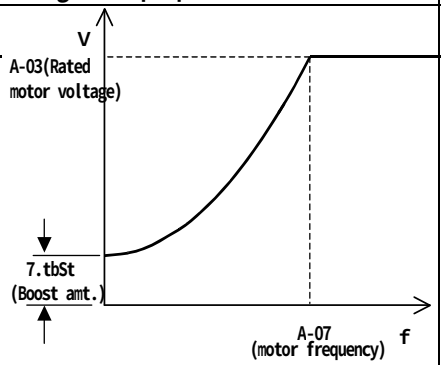
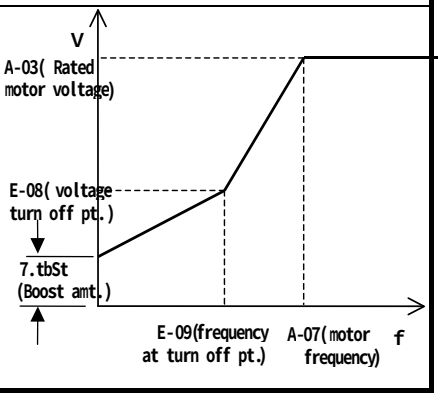
| Manual boost | Auto-boost |
|---|---|
| Adjust boost amount according to motor load characteristics from the Torque boost amount (7.tbSt). (Please select manual boost for multi-motor drive.) | Automatically adjust boost amount according to load. (It invalids the setting of Torque boost amount (7.tbSt).) Dead time compensation and primary resistance must be set precisely so that please execute automatic tuning before the auto-boost.<br>For more information about Dead time compensation and primary resistance, please refer to Chapter4 4.2 <A-area>.<br>(Auto-boost cannot be used with multi-motor drive.) |
|  |  |

V/f pattern selection

| Display | Items | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| E-07 | V/f pattern selection | 0: V/f liner<br>1: Square reduction<br>2: polygonal line | — | 0 | — |
| E-08 | Voltage at turnoff point | (200V class) 0 to 230<br>(400V class) 0 to 460 | 1 | 0 | V |
| E-09 | Frequency at turnoff point | 0.0 to Maximum frequency (A-00) | 0.1 | 0.0 | Hz |

Select the pattern of V/f according to load characteristics.

V/fmode

| V/f pattern liner | V/f pattern square reduction | V/f pattern polygonal line |
|---|---|---|
| This pattern is used when the load has constant torque characteristic. | Effective when the load has square reduction torque characteristic. (e.g. fan pump etc.) | Effective when the load has dual torque characteristic. |
|  |  |  |

## 4.7. F-area (Built-in DB (dynamic brake) operation, protection function, trace back setting area)

**Built-in DB (dynamic brake) operation level setting**

| Display | Item | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| F-00 | Built-in DB (Dynamic Brake) operation level | (200V class) 320.0 to 360.0 | 0.1 | 340.0 | V |
| | | (400V class) 640.0 to 720.0 | 0.1 | 680.0 | V |

Both VF66B-2R222 – 2222 (200V class) and VF66B-2R244 – 2244 (400V class) have a built-in transistor for DB (dynamic brake) and dynamic braking is available if a DB resistor and a thermal relay are inserted between [+2] and [B] on the main circuit terminal block. The operation level of this built-in DB transistor is set by the Built-in DB operation level (F-10). Built-in DB transistor will be turned ON when DC voltage is higher than this setting and turned OFF when the DC voltage is lower than this setting. Under normal conditions this setting should stay on the default setting, however, in case if the power voltage is high and makes it turn ON even when not in the brake mode, then set higher value.

Note: If this function is used with the regeneration converter VF61R or VF64R, please select 360V (200V class) or 720V (400V class) for this setting.

**Overfrequency protection setting**

| Display | Items | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| F-01 | Forward overfrequency setting | 0.0 to 150.0 | 0.1 | 105.0 | % |
| F-02 | Reverse overfrequency setting | -150.0 to 0.0 | 0.1 | -105.0 | % |

Overfrequency protection will be activated and the inverter will be tripped when output frequency exceed Forward overfrequency setting (F-01) or Reverse overfrequency setting (F-02) with respect to the maximum frequency. Overfrequency protection can be set in forward direction and reverse direction separately.

Note: When the Maximum frequency (A-00) is changed, please readjust this setting.

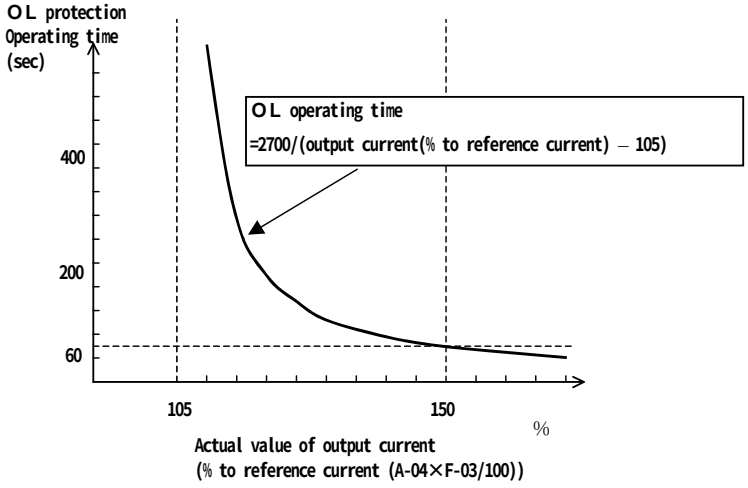
**CAUTION** [Overfrequency protection setting]

- Please do not set the value considerably larger than the rated speed of the motor to the Forward overfrequency setting (F-01) or Reverse overfrequency setting (F-02). There is possibility of cause serious accident.

**Overload protection setting**

| Display | Items | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| F-03 | Overload protection setting | 20 to 110 | 1 | 100 | % |

Set the reference current value for the overload protection in the rate against the Rated motor currnet (A-04). Overload protection counter will be initiated when the effective value of the inverter output current exceeds 105% of the reference current and the overload protection (OL) will be activated in the 60 seconds carve when the output current is 150% as shown in figure below.




Overload protection (OL) duration

Note: Overload counter can be monitored from the console. (It is compared with the overtorque counter and whichever has a greater value will be displayed.)
Overload counter starts count when it is in an overload condition with time and overload protection will be activated and inverter will be tripped when it becomes 100%.
OL pre-alarm function can be used so that signal is output when the count on the overload counter exceeds given point. For more information, refer to Chapter3 3.9 <H-area (multi-function output setting area)> also Chapter4 4.9 <H-area (multi-function output setting area)>.

**Cumulative operation timer setting**

| Display | Items | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| F-04 | Cumulative operation timer(1-Capacitor) | 0 to 65535 | 1 | Note 1 | Hr |
| F-05 | Cumulative operation timer(2-Fan) | 0 to 65535 | 1 | Note 1 | Hr |

Note 1: See also table below.

Factory default data for F-04 and F-05

| Inverter type | Default data F-04 | Default data F-05 | Inverter type | Default data F-04 | Default data F-05 |
|---|---|---|---|---|---|
| 2R222 | 43800 | 21900 | 2R244 | 43800 | 21900 |
| 3R722 | | | 3R744 | | |
| 5R522 | | | 5R544 | | |
| 7R522 | | | 7R544 | | |
| 1122 | | | 1144 | | |
| 1522 | | | 1544 | | |
| 2222 | | | 2244 | | |
| 3022 | | | 3044 | | |
| 3722 | | | 3744 | | |
| 4522 | | | 4544 | | |
| 5522 | | | 5544 | | |
| 7522 | | | 7544 | | |
| 9022 | | | 11044 | | |
| 15022 | | | 16044 | | |
| 18022 | | | 20044 | | |
| | | | 25044 | | |
| | | | 31544 | | |
| | | | 40044 | | |
| | | | 50044 | | |
| | | | 60044 | | |
| | | | 75044 | | |
| | | | 100044 | | |

In VF66B, cumulative operation time is counted in 1-hour unit. When the cumulative time exceeds the setting value of the Cumulative operation timer (1-Capacitor) (F-04) or Cumulative operation timer (2-Fan) (F-05), then the LED <ALM> of the SET66-Z or SET66EX-Z will be lit. This function can be used as a guide of maintenance timing for the VF66B.

If the cumulative operation timer setting is not changed from the factory default value, the Cumulative operation timer (1-Capacitor) (F-04) and Cumulative operation timer (2-Fan) (F-05) will indicate rough estimation of capacitor life and cooling fan life respectively.

When timer remaining time 1 of the monitor display item becomes 0 or less, it is indicating the time for capacitor replacement and recommends the replacement.

Similarly, when timer remaining time 2 becomes 0 or less, it is indicating the time for cooling fan replacement.

Note: For more information about monitor items and cooling fan replacement, please refer to instruction manual (trouble shooting/maintenance).

Motor overheating protection

| Display | Item | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| F-06 | Motor overheat protection operation selection | OFF (without protection operation)<br>ON (with protection operation) | — | OFF | — |

Select ON/OFF of the motor overheat protection. When this function is ON, the inverter will be tripped when the motor temperature exceeds 150 degrees in Celsius.

Note: TVPT66-Z option or TVTH66-Z option as well as a motor temperature sensor are required for this function.

**Operation setting of the protection relay (86A) in case of power failure**

| Display | Item | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| F-07 | Protection relay (86A) operation selection upon power failure | OFF (without protection operation)<br>ON (with protection operation) | — | OFF | — |

Select the operation of the protection relay (86A) in case of the detection of power failure by the inverter.

OFF: Protection relay will not be activated even if power failure is detected and power failure can be reset by only turning OFF the Operation command after power recovery (or Jog command or DC brake command). In addition, when the Instantaneous power interruption restart (b-07) is ON, it will be reset automatically after the recovery of power and resumes operation.

ON: Protection relay will be activated and inverter will be tripped in case of the detection of power failure. In this case, like other protection operation, protection resetting by the reset terminal or [STOP/RESET] key is required. Moreover, even if the Instantaneous power interruption restart (b-07) is turned ON, it will not resume operation automatically.

**Protection retry function setting**

| Display | Item | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| F-08 | Protection retry count setting | 0 to 5 | 1 | 0 | Count |

When the protection operation activates or occurs, repeat [Automatic protection reset] → [Automatic operation resuming] up to the count set at the Protection retry count setting (F-08). Automatic reset will take place 1 second after the occurrence of a protection operation, then operation will resume automatically. If another protection operation is occurred within 10 seconds after resuming of operation, add +1 to the retry counter and reset again to resume the operation if retry count on the retry counter is equal or less than the value set in the Protection retry count setting (F-08). Retry counter will be cleared and it will be assumed that the retry is succeeded if another protection operation is not occurred within 10 seconds after the resuming of operation by the automatic operation resuming.

Note: The protective operations which can be retried are limited to following protections: overvoltage, overspeed, over frequency, power failure (when 86A is ON), option error and external failure (operation of protection relay 86A). For other protections, retry is not available for safety reasons.

**External failure detection delay time setting**

| Display | Items | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| F-09 | External failure(1) detection delay time | 0.0 to 30.0 | 0.1 | 0.0 | sec |
| F-10 | External failure(2) detection delay time | 0.0 to 30.0 | 0.1 | 0.0 | sec |
| F-11 | External failure(3) detection delay time | 0.0 to 30.0 | 0.1 | 0.0 | sec |
| F-12 | External failure(4) detection delay time | 0.0 to 30.0 | 0.1 | 0.0 | sec |

Time for detecting external failure signals can be delayed in accordance with the values set in the External failure detection delay time 1 - 4 (F-09 - F-12). This function can be used for adjusting detecting sensitivity of the external failure signals.

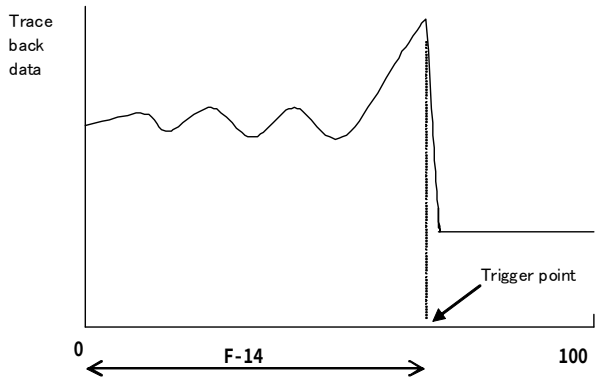
Trace back function setting

| Display | Items | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| F-13 | Traceback pitch | 0 to 100 | 1 | 1 | msec |
| F-14 | Traceback trigger point | 1 to 99 | 1 | 80 | — |
| F-15 | Traceback CH1 selection | 0 to 12 | 1 | 0 | — |
| F-16 | Traceback CH2 selection | 0 to 12 | 1 | 0 | — |
| F-17 | Traceback CH3 selection | 0 to 12 | 1 | 0 | — |
| F-18 | Traceback CH4 selection | 0 to 12 | 1 | 0 | — |
| F-19 | Traceback CH5 selection | 0 to 12 | 1 | 0 | — |
| F-20 | Traceback CH6 selection | 0 to 12 | 1 | 0 | — |
| F-21 | Traceback CH7 selection | 0 to 12 | 1 | 0 | — |
| F-22 | Traceback CH8 selection | 0 to 12 | 1 | 0 | — |
| F-23 | Traceback CH9 selection | 0 to 12 | 1 | 0 | — |
| F-24 | Traceback CH10 selection | 0 to 12 | 1 | 0 | — |
| F-25 | Traceback CH11 selection | 0 to 12 | 1 | 0 | — |
| F-26 | Traceback CH12 selection | 0 to 12 | 1 | 0 | — |

VF66B has a trace back function which stores the control data such as current data and voltage data at the time of the protection occurred and allows prompt recovery by retrieving and analyzing stored data. The data stored by the trace back function are the data set by default value, current and voltage, in addition, it is possible to specify the output of each built-in PLC when PLCH function is used.

- **Traceback pitch (F-13)**
  Set the pitch of trace back.
- **Traceback trigger point (F-14)**
  Set the trigger point of trace back.
- **Traceback CH1 - 12 selection (F-15 to 26)**
  Select each channel of trace back either as an internal data of the inverter or as a parameter of the built-in PLC function.

Note: Settings of trace back pitch and trace back point are needed to be set prior to the collection of the trace back data by the protection operation.




Trace back point setting

| F-15 – 26 setting | 0 | | 1 to 12 | |
|---|---|---|---|---|
| | Recording data | Dimension | Recording data | Dimension |
| ch 1 | U-phase current | (3536/rated current of inverter) | Output RAM (1 - 12) of PLC (Setting of F-15 to 26 directly reflects selection of output RAM) | 20000 ／ 100% |
| ch 2 | V-phase current | | | |
| ch 3 | W-phase current | | | |
| ch 4 | DC voltage | 10/1V (200V class) 5/1V (400V class) | | |
| ch 5 | Output voltage | | | |
| ch 6 | Not used | — | | |
| ch 7 | Frequency command (after accel/decel control) | 20000/ Max. frequency | | |
| ch 8 | Calculated torque | 5000/100% | | |
| ch 9 | Output frequency | 20000/ Max. frequency | | |
| ch 10 | Not used | — | | |
| ch 11 | Not used | — | | |
| ch 12 | Motor temperature | 10/1°C | | |

Note: By using PC Tool software (sold separately), it is possible to retrieve the trace data from the PC. For more information, please refer to separate <VF66 series PC Tool user manual>.

## 4.8. G-area (Analog input/output setting area)

**Temperature detection selection**

| Display | Item | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| G-00 | Temperature detection selection | 0: not use<br>1: thermistor (TVTH66-Z, optional)<br>2: pt100 [thermocouple](TVPT66-Z, optional) | — | 0 | — |

Select the motor temperature detector installed in the motor.

0: No temperature detection

1: Use TVTH66-Z option

2: Use TVPT66-Z option

For more information, please refer to user manual of the option.

**Motor temperature detection adjustment (when TVTH66-Z option or TVPT66-Z option is used)**

| Display | Item | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| G-01 | Temperature detection offset adjustment | -20.0 to 20.0 | 0.1 | 0.0 | % |
| G-02 | Temperature detection gain adjustment | 50.0 to 150.0 | 0.1 | 100.0 | % |

Adjust the offset and gain of the temperature detected by the motor temperature compensation option TVTH66-Z or TVPT66-Z. For more information, please refer to user manual of the option.

**Analog input (2) characteristic selection (when I066-Z option or digital communication option is used)**

| Display | Item | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| G-03 | Analog input(2) characteristics selection | 0:0 to ±10V<br>1:0 to 10V<br>2:4 to 20mA | — | 1 | — |

Select the input characteristics of the analog input (2) terminal AIN2 for the I066-Z option or the digital communication option.

When the Analog input (2) characteristic selection is set to 2, SW operation of the I066-Z option or the digital communication option is required. For more information, please refer to user manual of the option.

**Analog input (2) limit setting (when I066-Z option or digital communication option is used)**

| Display | Items | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| G-04 | Analog input(2) upper limit frequency | Absolute value of analog input (2) lower limit frequency (G-05) to 100.0 | 0.1 | 100.0 | % |
| G-05 | Analog input(2) lower limit frequency | -Analog input(2) upper limit frequency (G-04) to Analog input(2) upper limit frequency (G-04) | 0.1 | 0.0 | % |

This setting is available only when I066-Z option or digital communication option is used.

Set the upper and lower limits of operation frequency in % relative to the maximum rotation speed when analog input set in the Analog input(2) characteristics selection (G-03) is input in the analog input terminal AIN2 as a speed command. In the forward rotation, even if the speed command greater than the frequency set in the Analog input(2) upper limit frequency (G-04) is input to the AIN2, operation frequency of the motor will be regulated to the setting of the G-04. In the reverse rotation, operation frequency will be regulated so that it will not exceed the value set in the Analog input (2) lower limit frequency (G-05). For more information, please refer to user manual of the option.

**Analog input (3) characteristic selection (when I066-Z option is used)**

| Display | Items | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| G-06 | Analog input(3) characteristics selection | 0:0 to ±10V<br>1:0 to 10V<br>2: not use<br>3: Pulse train (0[Hz] to 150[kHz]) | — | 1 | — |

Select the input characteristic of the analog input terminal AIN3 of the I066-Z option. For more information, please refer to user manual of the option.

For more information about the voltage characteristic (0 to ±10[V] and 0 to 10[V]) and the current characteristic (4 to 20[mA]) of analog input, please refer to Chapter4 4.3 b-area <Analog frequency command characteristic selection>(b-17), <Analog frequency command upper limit frequency> (b-18) and <Analog frequency command lower limit frequency> (b-19).

**• Pulse train input (G-06=3)**

When this function is used in pulse train, set the SW4 on the P board to "1" side, and pulse signal of duty1:1 is input between the terminals [AIN3] and [G-IN] with voltage of 0 to 15V. Setting characteristics are same as the characteristics of voltage input (0 to 10V), therefore, please replace the item described in "0 to 10V" with "0 to 150kHz" for this setting. For more information about the voltage input (0 to 10V), please refer to Chapter4 4.3 b-area.

**Analog input (3) limit setting (when IO66-Z option is used)**

| Display | Items | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| G-07 | Analog input(3) upper limit frequency | Absolute value of Analog input(3) lower limit frequency (G-08) to 100.0 | 0.1 | 100.0 | % |
| G-08 | Analog input(3) lower limit frequency | -Analog input(3) upper limit frequency (G-07) to Analog input(3) upper limit frequency (G-07) | 0.1 | 0.0 | % |

This setting is available only when IO66-Z option is used. Set the upper and lower limits of operation frequency in % relative to the maximum frequency when analog input set in the Analog input(3) characteristics selection (G-06) is input in the analog input terminal AIN3 as a speed command. For more information, please refer to user manual of the option.

**Analog output (2) characteristic selection (when IO66-Z option or digital communication option is used)**

| Display | Items | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| G-09 | Analog output(2) characteristics selection | 0: Output voltage<br>1: Output current<br>2: Torque command<br>3: Frequency<br>4: Frequency command<br>5: Built-in PLC output<br>6: Calibration<br>7: Internal monitor | — | 1 | — |

For more information, please refer to user manual of the option.

**Analog output (3) characteristic selection (when IO66-Z option is used)**

| Display | Items | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| G-10 | Analog output(3) characteristics selection | 0: Output voltage<br>1: Output current<br>2: Torque command<br>3: Frequency<br>4: Frequency command<br>5: Built-in PLC output<br>6: Calibration<br>7: Internal monitor<br>8: Output voltage (4 to 20mA)<br>9: Output current (4 to 20mA)<br>10: Torque command (4 to 20mA)<br>11: Frequency (4 to 20mA)<br>12: Frequency command (4 to 20mA)<br>13: Built-in PLC output (4 to 20mA)<br>14: Calibration (12mA output) | — | 0 | — |

For more information, please refer to user manual of the option.

**Analog output set at G-09 (Selection items 0 to 7)**

**Analog output set at G-10 (Selection items 0 to 14)**

| | Selection items | Output voltage | | Selection items | Output current |
|---|---|---|---|---|---|
| 0 | Output voltage | 7.5V/200V (200V class)<br>7.5V/400V (400V class) | 8 | Output voltage | 16mA/200V (200V class)<br>16mA/400V (400V class) |
| 1 | Output current | 5V/inverter rated current | 9 | Output current | 12mA/ inverter rated current |
| 2 | Torque command | 5V/100% | 10 | Torque command | 12mA/100% |
| 3 | Frequency | 10V/Maximum frequency (A-00) | 11 | Frequency | 20mA/Maximum frequency (A-00) |
| 4 | Frequency command (after accel/decel control) | 10V/Maximum frequency (A-00) | 12 | Frequency command (after accel/decel control) | 20mA/Maximum frequency (A-00) |
| 5 | Built-in PLC output | 5V/ 20000(100%)* | 13 | Built-in PLC output | 12mA/ 20000(100%)* |
| 6 | Calibration | Outputs 5V | 14 | Calibration | Outputs 12mA |
| 7 | Internal monitor | — | — | — | — |

* Please refer to the function description of Control Block Editor.

Note: When output of 4 to 20mA is used, please refer to user manual of the option.

**Analog input (4) characteristic selection (when IOEXT66-Z option is used)**

| Display | Item | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| G-11 | Analog input(4) characteristics selection | 0: 0 to ±10V<br>1: 0 to 10V<br>2: 4 to 20mA | — | 1 | — |

Select the input characteristic of the analog input terminal AIN4 of the IOEXT66-Z option. For more information, please refer to user manual of the option.

**Analog input (5) characteristic selection (when IOEXT66-Z option is used)**

| Display | Item | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| G-12 | Analog input(5) characteristics selection | 0: 0 to ±10V<br>1: 0 to 10V<br>2: not use<br>3: Pulse train (0[Hz] to 150[kHz]) | — | 1 | — |

**Select the input characteristic of the analog input terminal AIN5 of IOEXT66-Z option. For more information, please refer to user manual of the option.**

**Analog output (4) characteristic selection (when IOEXT66-Z option is used)**

| Display | Item | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| G-13 | Analog output(4) characteristics selection | 0: Output voltage<br>1: Output current<br>2: Torque command<br>3: Frequency<br>4: Frequency command<br>5: Built-in PLC output<br>6: Calibration<br>7: Internal monitor | — | 2 | — |

**For more information, please refer to user manual of the option.**

**Analog output (5) characteristic selection (when IOEXT66-Z option is used)**

| Display | Item | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| G-14 | Analog output(5) characteristics selection | 0: Output voltage<br>1: Output current<br>2: Torque command<br>3: Frequency<br>4: Frequency command<br>5: Built-in PLC output<br>6: Calibration<br>7: Internal monitor<br>8: Output voltage (4 to 20mA)<br>9: Output current (4 to 20mA)<br>10: Torque command (4 to 20mA)<br>11: Frequency (4 to 20mA)<br>12: Frequency command (4 to 20mA)<br>13: Built-in PLC output (4 to 20mA)<br>14: Calibration (12mA output) | — | 3 | — |

**For more information, please refer to user manual of the option.**

Analog output selected by G-13 (Selection items 0 to 7)
Analog output selected by G-14 (Selection items 0 to 14)

| | Selection items | Output voltage | | Selection items | Output current |
|---|---|---|---|---|---|
| 0 | Output voltage | 7.5V/200V (200V class)<br>7.5V/400V (400V class) | 8 | Output voltage | 16mA/200V (200V class)<br>16mA/400V (400V class) |
| 1 | Output current | 5V/inverter rated current | 9 | Output current | 12mA/ inverter rated current |
| 2 | Torque command | 5V/100% | 10 | Torque command | 12mA/100% |
| 3 | Frequency | 10V/Maximum frequency (A-00) | 11 | Frequency | 20mA/Maximum frequency (A-00) |
| 4 | Frequency command (after accel/decel control) | 10V/Maximum frequency (A-00) | 12 | Frequency command (after accel/decel control) | 20mA/Maximum frequency (A-00) |
| 5 | Built-in PLC output | 5V/ 20000(100%)* | 13 | Built-in PLC output | 12mA/ 20000(100%)* |
| 6 | Calibration | Outputs 5V | 14 | Calibration | Outputs 12mA |
| 7 | Internal monitor | — | — | — | — |

* Please refer to the function description of Control Block Editor.

Note: When output of 4 to 20mA is used, please refer to user manual of the IOEXT66-Z.

Line speed setting

| Display | Item | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| G-15 | Line speed monitor adjustment | 0.0 to 2000.0 | 0.1 | 0.0 | — |

Adjust the display gain of the console monitor "Line speed".

Set the line speed at the Maximum frequency (A-00).

In the line speed monitor, following message is displayed:

Motor speed ×Line speed monitor adjustment (G-15) / Maximum frequency (A-00)

Analog input monitor display selection

| Display | Item | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| G-16 | Analog input monitor display selection | 1: Analog input (1) [AIN1]<br>2: Analog input (2) [AIN2]<br>3: Analog input (3) [AIN3]<br>4: Analog input (4) [AIN4]<br>5: Analog input (5) [AIN5] | — | 1 | — |

Set the channel of analog input to be displayed on the console monitor 88888

(G-16) = 1: Displays on "Vin" that the voltage value input to the analog input (1) terminal [AIN1] on the terminal block of the VFC66-Z board.

(G-16) = 2: Displays on "Vin" that the voltage value input to the analog input (2) terminal [AIN2] on the terminal block of the IO66-Z option board or communication option board.

(G-16) = 3: Displays on "Vin" that the voltage value input to the analog input (3) terminal [AIN3] on the terminal block of the IO66-Z option board.

(G-16) = 4: Displays on "Vin" that the voltage value input to the analog input (4) terminal [AIN4] on the terminal block of the IOEXT66-Z option board.

(G-16) = 5: Displays on "Vin" that the voltage value input to the analog input (5) terminal [AIN5] on the terminal block of the IOEXT66-Z option board.

Note: For change of monitor items and for monitor item list, please refer to the user manual (basic operation).

## 4.9. H-area (Multi-function output setting area)

**Multi-function input setting items**

| Display | Items | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| H-00 | Multifunction output terminal(1) function selection | 0: not used<br>1: Frequency detection (1)<br>(Frequency = detection setting)<br>2: Frequency detection (1)<br>(Frequency ≧ detection setting)<br>3: Frequency detection (1)<br>(Frequency ≦ detection setting)<br>4: Frequency detection (2)<br>(Frequency = detection setting)<br>5: Frequency detection (2)<br>(Frequency ≧ detection setting)<br>6: Frequency detection (2)<br>(Frequency ≦ detection setting)<br>7: Reach setting<br>8: Torque detection<br>9: Torque detection (absolute value)<br>10: Power failure<br>11: Overload pre-alarm<br>12: Retrying<br>13: in reverse operation<br>14: Protection operation code<br>15: not used<br>16: in operation<br>17: (For future extension option)*1<br>18: Timer 1 elapse<br>19: Timer 2 elapse<br>20: 2nd set-up block selected<br>21: Fan motor failed | — | 7 | — |
| H-01 | Multifunction output terminal(2) function selection | | — | 1 | — |
| H-02 | Multifunction output terminal(3) function selection | | — | 0 | — |
| H-03 | Multifunction output terminal(4 function selection | | — | 8 | — |
| H-04 | Multifunction output terminal(5) function selection | | — | 2 | — |
| H-05 | Multifunction output terminal(6) function selection | | — | 3 | — |
| H-06 | Frequency detection(1) | −Maximum frequency (A-00) to Maximum frequency (A-00) | 0.1 | 0 | Hz |
| H-07 | Frequency detection(2) | −Maximum frequency (A-00) to Maximum frequency (A-00) | 0.1 | 0 | Hz |
| H-08 | Frequency detection width | 0.0 to 10.0 | 0.1 | 0 | Hz |
| H-09 | Torque detection(with polarity) | -205 to 205 | 1 | 0 | % |
| H-10 | Torque detection(absolute value) | 0 to 205 | 1 | 0 | % |
| H-11 | Overload pre-alarm operation level setting | 0 to 100 | 1 | 50 | % |
| H-12 | Maximum frequency reduction rate | 50.0 to 100.0 | 0.1 | 90.0 | % |

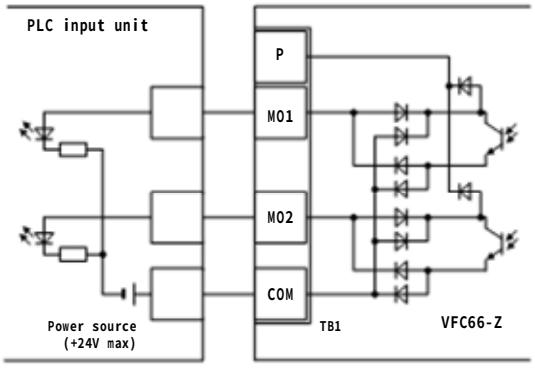
***1: Selection 17 for H-00 to H-05 is for a future extension option. Under normal conditions, please do not use this setting.**

**The multi-function output terminals (1) - (2) ([MO1] - [MO2] terminal block*1) on the VFC66-Z P board will be set as the output terminal blocks for each function of the multi-function output set by the Multifunction output terminal function selection (H-00) - (H-05). The terminal blocks [MO1] - [MO6] are open collector outputs. Note: When the PLC function usage selection (i-00) is ON, above settings are ignored and the multi-function output terminals ([MO1] - [MO6]terminal blocks) on the VFC66-Z P board or the option P board will be the output**

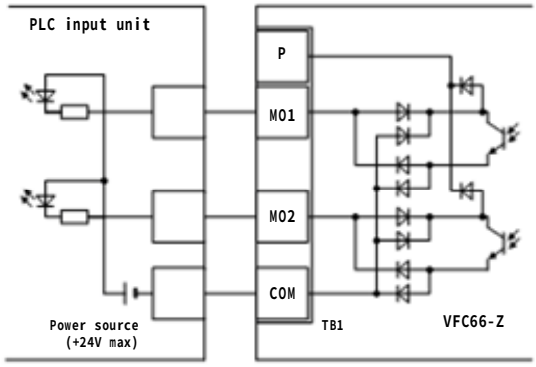
terminals of the PLC function. Following outputs of each function of the multi-function output can be used as the input for the PLC function.

*1: The terminal blocks [MO3] – [MO6] of the multi-function output terminals (3) - (6) are option.

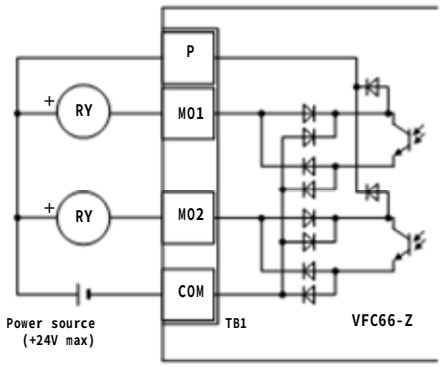
**Connection of multi-function output terminal (1) - (2)**




1. Connection with PLC (Source mode)



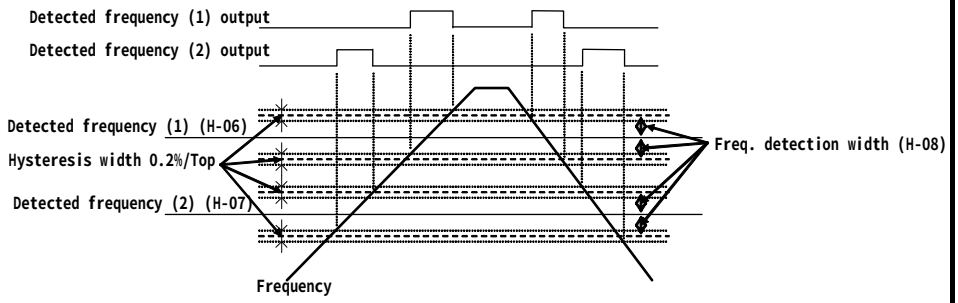
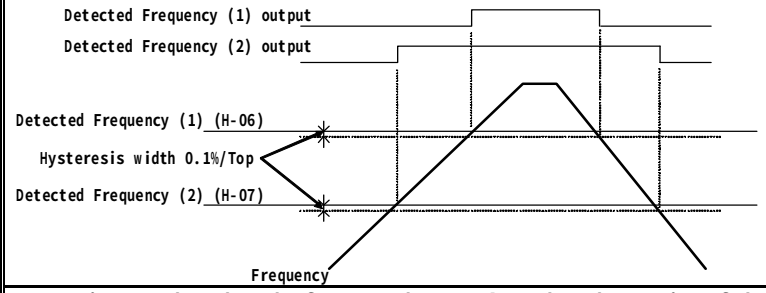
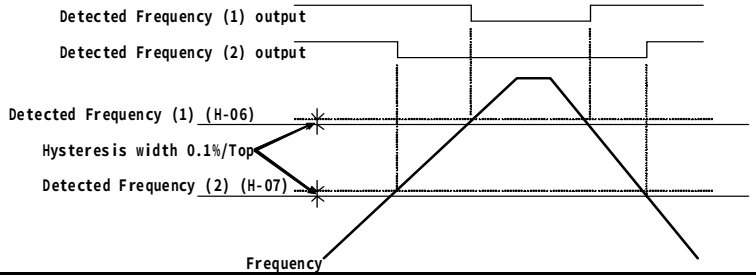
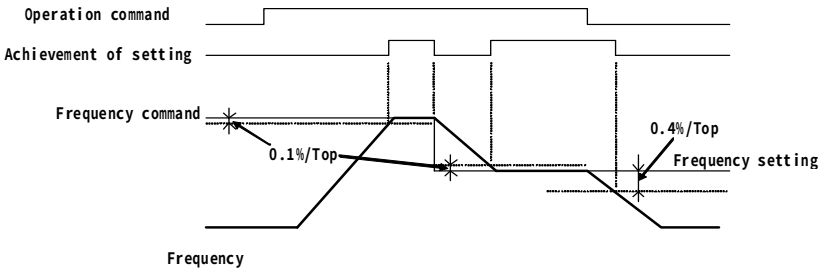
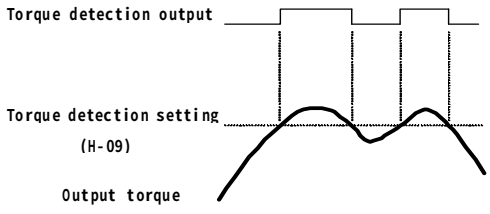

2. Connection with PLC (Sink mode)

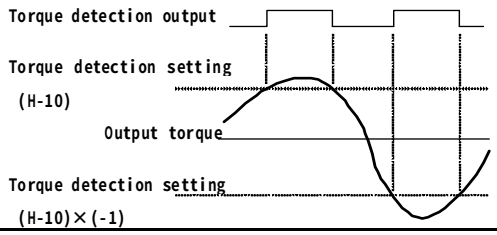
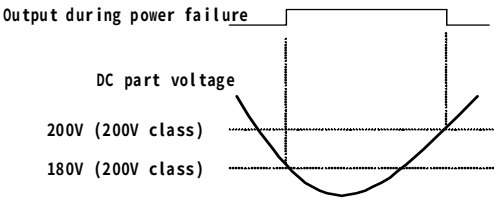
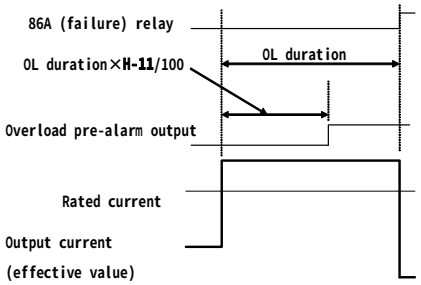



3. Connection with a relay

Above figure is showing typical connection of the multi-function output signal. Multi-function output is the open collector of the transistor and it requires external DC power source. **The maximum permissible voltage is 24V and the maximum permissible current is 20mA per terminal.**

**Detailed setting of multi-function output**

| No. | Items | Description of function |
|---|---|---|
| 1, 4 | Frequency detection (1) (2)<br><br>(Freq = detection setting) | Output is turned ON when agreement in frequency is made between the Frequency detection (1) (2) (H-06, H-07) setting and the ±Frequency detection width (H-08).<br>Hysteresis width of 0.2% of the Maximum frequency (A-00) is set for output.<br>* "Top" in the figure indicates the Maximum frequency (A-00).<br>  |
| 2, 5 | Motor speed detection (1) (2)<br><br>(Freq ≧detection setting) | Output is turned ON when the frequency becomes larger than the setting of the Frequency detection (1)(2)(H-06,H-07).<br>(Frequency is detected not in absolute value but with sign.)<br>  |
| 3, 6 | Frequency detection (1) (2)<br><br>(Freq ≦detection setting) | Output is turned ON when the frequency becomes less than the setting of the Frequency detection (1)(2)(H-06,H-07).<br>(Frequency is detected not in absolute value but with sign.)<br>  |
| 7 | Achievement of setting frequency | Output is turned ON when the frequency achieves ±0.1% of the frequency command value.<br>  |
| 8 | Torque detection | Output is turned ON when the calculated torque becomes greater than the setting of the Torque detection (with polarity) (H-09).<br>  |

<table>
<tr><th>No.</th><th>Items</th><th>Description of function</th></tr>
<tr><td>9</td><td>Torque detection (absolute value)</td><td>Output is turned ON when absolute value of the calculated torque becomes greater than the setting of the Torque detection (absolute value) (H-10).*<br> 
</td></tr>
<tr><td>10</td><td>During power failure</td><td>Output is turned ON when DC part voltage becomes equal to or less than 180V (200V class) / 360V (400V class) and turned OFF when the voltage becomes equal to or more than 200V (200V class) / 400V (400V class). Note: when the power of the control board is not available, then the output is turned OFF.<br> 
</td></tr>
<tr><td>11</td><td>Overload pre-alarm</td><td>When it becomes overload condition specified in the Overload protection setting (F-03), overload counter will be initiated and when it becomes greater than the setting level of the Overload pre-alarm operation level setting (H-11), then output is turned ON. The count value in which overload protection is occurred is set as 100%. (e.g. If overcurrent protection is occurred at 150% current for 60 seconds, and if 50% is set to the Overload pre-alarm operation level setting (H-11) and when output current becomes 150%, then it will be ON at 30 seconds which is 50% of the overload protection duration (60 seconds).<br> 
</td></tr>
<tr><td>12</td><td>Retrying</td><td>Turned ON for 10 seconds after the protection operation retry. For more information, please refer to F-aria.</td></tr>
<tr><td>13</td><td>Operation in reverse</td><td>Turned ON when output frequency is negative.</td></tr>
<tr><td>14</td><td>Protection operation code</td><td>When failure protection is activated, the code of which protection is activated will be output by using four multi-function output terminals. (Unlike other function, this function requires setting of the protection operation code to four multi-function output terminals.)<br><List of output code>
<table>
<tr><th>Items</th><th>MO1</th><th>MO2</th><th>MO3</th><th>MO4</th><th>Items</th><th>MO1</th><th>MO2</th><th>MO3</th><th>MO4</th></tr>
<tr><td>Overcurrent protection</td><td>ON</td><td>OFF</td><td>OFF</td><td>OFF</td><td>Sensor-less start error</td><td>ON</td><td>ON</td><td>ON</td><td>OFF</td></tr>
<tr><td>IGBT protection</td><td>OFF</td><td>ON</td><td>OFF</td><td>OFF</td><td>Sensor error</td><td>ON</td><td>ON</td><td>ON</td><td>OFF</td></tr>
<tr><td>Unit overheat</td><td>OFF</td><td>ON</td><td>OFF</td><td>OFF</td><td>PG error</td><td>ON</td><td>ON</td><td>ON</td><td>OFF</td></tr>
<tr><td>Abnormality in parallel slave</td><td>OFF</td><td>ON</td><td>OFF</td><td>OFF</td><td>CPU abnormality</td><td>OFF</td><td>OFF</td><td>OFF</td><td>ON</td></tr>
<tr><td>Charging resistance overheat</td><td>OFF</td><td>ON</td><td>OFF</td><td>OFF</td><td>Memory abnormality</td><td>OFF</td><td>OFF</td><td>OFF</td><td>ON</td></tr>
<tr><td>DC part overvoltage</td><td>ON</td><td>ON</td><td>OFF</td><td>OFF</td><td>Option error</td><td>OFF</td><td>OFF</td><td>OFF</td><td>ON</td></tr>
<tr><td>Overload protection</td><td>OFF</td><td>OFF</td><td>ON</td><td>OFF</td><td>Communication timeout error</td><td>ON</td><td>OFF</td><td>OFF</td><td>ON</td></tr>
<tr><td>FCL protection</td><td>OFF</td><td>OFF</td><td>ON</td><td>OFF</td><td rowspan="2">Inadequate voltage (Power failure)</td><td rowspan="2">OFF</td><td rowspan="2">ON</td><td rowspan="2">OFF</td><td rowspan="2">ON</td></tr>
<tr><td>Overtorque protection</td><td>OFF</td><td>OFF</td><td>ON</td><td>OFF</td></tr>
<tr><td>Motor overheat</td><td>OFF</td><td>OFF</td><td>ON</td><td>OFF</td><td>Setting error<br>8888</td><td>ON</td><td>ON</td><td>OFF</td><td>ON</td></tr>
</table></td></tr>
</table>

| No. | Items | Description of function | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Abnormality in current sensor | ON | OFF | ON | OFF | External failure 1 | OFF | OFF | ON | ON |
| | | Phase loss | ON | OFF | ON | OFF | External failure 2 | ON | OFF | ON | ON |
| | | Starting jam | OFF | ON | ON | OFF | | | | | |
| | | Overspeed protection | ON | ON | ON | OFF | External failure 3 | OFF | ON | ON | ON |
| | | Overfrequency protection | ON | ON | ON | OFF | External failure 4 | ON | ON | ON | ON |
| | | Speed control error | ON | ON | ON | OFF | | | | | |
| 16 | In operation | Turned ON during the operation of the motor. | | | | | | | | | |
| 18 | Timer 1 elapse | Turned ON when cumulative operation time becomes greater than the setting value of the Cumulative operation timer (1-Capacitor) (F-04). | | | | | | | | | |
| 19 | Timer 2 elapse | Turned ON when cumulative operation time becomes greater than the setting value of the Cumulative operation timer (2-Fan) (F-05). | | | | | | | | | |
| 20 | 2nd set-up block selected | Turned ON when the 2nd set-up block is selected. | | | | | | | | | |
| 21 | Fan motor failed | Turned ON when fan motor is failed. | | | | | | | | | |

* Accuracy compensation for calculated torque is not available in V/f mode. In accuracy of torque is required, please use vector mode.

## 4.10. i-area (Built-in PLC, droop control setting area)

**PLCL function selection**

| Display | Item | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| i-00 | PLCL function usage selection | OFF (not use)<br>ON (use) | — | OFF | — |

Turn ON when PLCL function is used. Please set it to OFF under normal conditions.

For more information, please refer to description of PLC function in the separate booklet <VF66 series PC Tool user manual>.

**PLCH function selection**

| Display | Item | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| i-01 | PLCH function usage selection | 0: OFF (not use)<br>1: PLCH ON<br>2: PLCH ON (frequency command input = PLCH output) | — | 0 | — |

Select 1 or 2 when PLCH function is used. Please set it to 0 under normal conditions.

Note: When 2 is selected for the PLCH function usage selection (i-01);

- When the operation command is ON, the motor will immediately start rotating at the frequency set in the Frequency command (0.SrEF) regardless of the setting of the Acceleration (1) (3.SrEF).
- When the operation command is OFF, it becomes free stop.

For more information, please refer to description of PLC function in the separate booklet <VF66 series PC Tool user manual>.

**Droop control setting**

| Display | Items | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| i-02 | Droop control usage selection | OFF (not use)<br>ON (use) | — | OFF | — |
| i-03 | Droop start frequency | 0.0 to 100.0 | 0.1 | 0.0 | % |
| i-04 | Droop rate changeover frequency | 0.0 to 100.0 | 0.1 | 0.0 | % |
| i-05 | Droop rate | 0.0 to 50.0 | 0.1 | 0.0 | % |
| i-06 | Droop start torque | 0.0 to 90.0 | 0.1 | 0.0 | % |

Note: Droop start frequency (i-03) and Droop rate changeover frequency (i-04) are set in % with respect to the Maximum frequency (A-00).

Set-up each setting of droop control for the purpose such as balancing of torques between two motors.

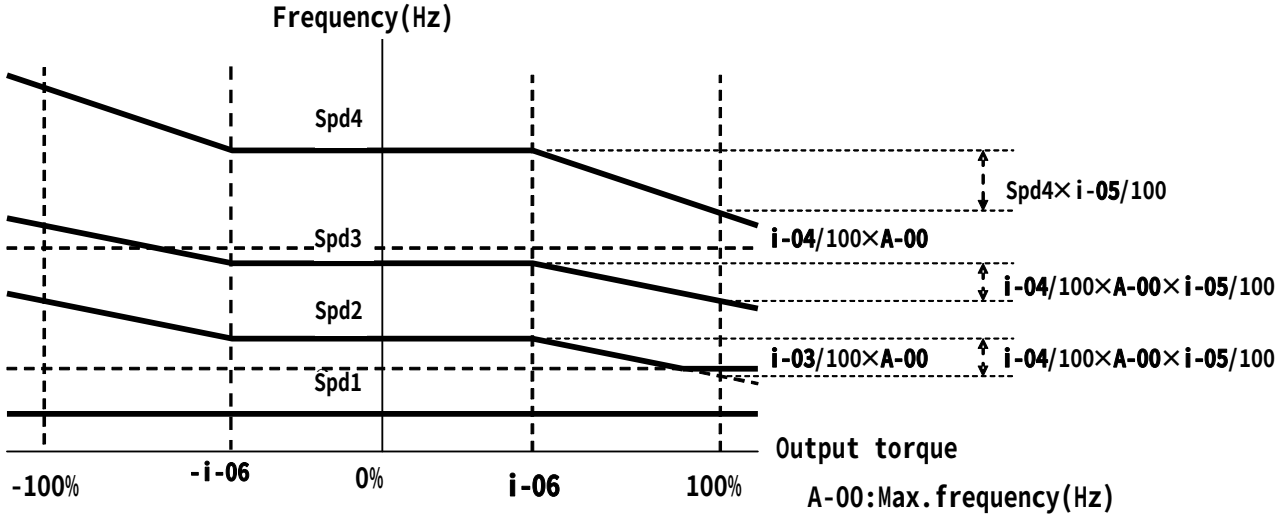
Droop control usage selection (i-02): Select ON/OFF of the droop control.

Droop start frequency (i-03): Starts droop control when the speed becomes equal to or greater than the Droop start frequency (i-03). (When frequency drops to this frequency or less, then it will limit at this frequency.)

Droop rate changeover frequency (i-04): When the frequency command is equal to or greater than the Droop rate changeover frequency (i-04), amount of droop will be based on the Frequency command (0.FrEF). When the frequency is less than the Droop rate changeover frequency (i-04), amount of droop will be based on the Droop rate changeover frequency (i-04). (In order to droop entirely with the rate relative to the Frequency command (0.FrEF), set 0.0% to the Droop rate changeover frequency (i-04). In prder to droop whole area with the rate relative to the Maximum frequency (A-00), set 100% to the Droop rate changeover frequency (i-04).)

Droop rate (i-05): Set the droop amount at 100% torque command in rate of droop amount (%) relative to reference frequency (when the frequency is equal to or greater than the Droop rate changeover frequency (i-04), then it will be Frequency command (0.FrEF) and when the frequency is less than the Droop rate changeover frequency (i-04), then it will be the setting of the Droop rate changeover frequency (i-04).

Droop start torque (i-06): Droop will not be activated if the torque is below this torque setting.




Droop control characteristic

V/fmode

Note: Droop control in V/f mode is an abridged version. There is no guaratee in accuracy of droop amount. If accuracy is required, please switch inverter mode to Induction motor vector mode.

## 4.11. J-area (Digital communication option setting area)

**Digital communication option setting**

| Display | Items | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| J-00 | Digital communication option selection | 0: OFF<br>1: OPCN66-Z<br>2: ASYC66-Z<br>3: DNET66-Z<br>4: PBUS66-Z<br>5: IO66-Z<br>6: (For future extension option)*1<br>7: CC66-Z | — | 0 | — |
| J-01 | ASYC66-Z/CC66-Z baud rate | (ASYC66-Z)<br>0: 1200bps<br>1: 2400bps<br>2: 4800bps<br>3: 9600bps<br>4: 19200bps<br>5: 38400bps<br>(CC66-Z)<br>0: 156kbps<br>1: 625kbps<br>2: 2.5Mbps<br>3: 5Mbps<br>4: 10Mbps<br>5: 10Mbps | — | 4 | — |
| J-02 | OPCN66-Z baud rate | 0: 125kbps<br>1: 250kbps<br>2: 500kbps<br>3: 1Mbps<br>4: (For factory adjustment) *2 | — | 3 | — |
| J-03 | PBUS66-Z slave address | 0 to 126 | 1 | 2 | — |
| J-04 | OPCN66-Z input | 3 to 19 | 1 | 14 | — |
| J-05 | OPCN66-Z output | 2 to 12 | 1 | 6 | — |
| J-06 | (For future extension option) | Please stay on the default value. | — | 0 | — |
| J-07 | ASYC66-Z.OPCN66-Z transmission selection/CC66-Z version selection | (ASYC66-Z)<br>0: 0ms<br>1: 5ms<br>2: 10ms<br>3: 20ms<br>4: 40ms<br>5: 60ms<br>6: 100ms<br>(CC66-Z)<br>Version / Exclusive station<br>0: 1.1 / 1<br>1: 1.1 / 2<br>2: 1.1 / 3<br>3: 1.1 / 4<br>4: 2.0(2×) / 1<br>5: 2.0(4×) / 1<br>6: 2.0(8×) / 1<br>(OPCN66-Z)<br>Baud rate (J-02)[bps]<br>125k / 250k<br>0:200μs / 200μs<br>1:200μs / 200μs<br>2:200μs / 200μs<br>3:200μs / 200μs<br>4:200μs / 150μs<br>5:200μs / 100μs<br>6:200μs / 100μs<br>Baud rate (J-02)[bps]<br>500k / 1M<br>0:200μs / 200μs<br>1:200μs / 200μs<br>2:200μs / 200μs<br>3:200μs / 200μs<br>4:150μs / 150μs<br>5:100μs / 100μs<br>6:50μs / 50μs | — | 0 | — |
| J-08 | ASYC66-Z/PBUS66-Z Communication mode selection | (ASYC66-Z)<br>0: standard mode<br>1: Positioning mode 1<br>2: positioning mode 2<br>(PBUS66-Z)<br>0: PROFIDRIVE mode<br>1: Factory original mode<br>2: Special mode | — | 0 | — |
| J-09 | DNET66-Z output instance number setting | 0: Instance No.20<br>1: Instance No.21<br>2 to 10: (Factory original communication mode) | — | 0 | — |

| Display | Items | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| J-10 | DNET66-Z input instance number setting | 0: Instance No.70<br>1: Instance No.71<br>2 to 15: (Factory original communication mode) | — | 0 | — |
| J-11 | DNET66-Z speed scale setting | -126 to 127 | — | 3 | — |
| J-12 | DNET66-Z monitor data number setting | 0 to 119 | — | 3 | — |
| J-13 | HighSpeed response input selection | 0: Communication<br>1: Analog input (2)(AIN2) | — | 0 | — |
| J-14 | Date/Time data selection from communication | 0: without date/time data<br>1: with date/time data | — | 0 | — |
| J-15 | Connected number of outside DB(Dynamic Brake) units with communication | 0 to 6 | 1 | 0 | — |

*1: J-00=6 is for a future extension option. Under normal conditions, please do not use this setting.

*2: J-02=4 is for factory adjustment. Under normal conditions, please stay on the factory setting.

J-00:

Operable with either this setting is OFF or the digital communication option is selected for speed commanding place or operation commanding place, and multi-function input is also operable, however, no option error check is executed so that please set appreciate value for the option installed. Note: Selecting the value other than 0 when no option is connected causes option error and brings inverter trip.

J-01 through 08:

This is the setting when ASYC66-Z (asynchronous RS485, RS422-A and RS232C communication option), OPCN66-Z (OPCN-1 communication option), PBUS66-Z (PROFIBUS communication option) or CC66-Z (CC-Link communication option) is used. Please refer to instruction manual of each option. Under normal conditions, please stay on the factory default value.

J-09 through 12:

This is the setting when DNET66-Z (DeviceNet communication option) is used. Please refer to instruction manual of DNET66-Z option for more information.

J-13:

It is recommended that select "1" for the HighSpeed response input selection (J-13) when "1" (Analog input (2) [AIN2]) is selected for the Torque command input (i-08), and select "0" for the HighSpeed response input selection (J-13) when "2" (communication) is selected for the Torque command input (i-08). With this setting, high-speed downloading of torque command input value becomes possible.

J-14:

Select with or without of date-hour data from the digital communication option.

J-15 :

The number describing how many external DB option (regeneration brake) connected with communication function.

For more information, please refer to instruction manual of each option.

## 4.12. L-area (Input gain, output gain setting area)

**Vdc gain setting**

| Display | Item | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| L-00 | Vdc detection gain | 80.0 to 120.0 | 0.1 | 100.0 | % |

Detection adjusting gain for the DC voltage detected by VF66B.

Note: This Vdc gain will be back calculated and set by inputting the voltage between ⊕ 2 - ⊖ at the time of memory initialization. Under normal conditions please stay on the factory default value.
When the main printed circuit board (such as GAC66-Z or MAC66-Z)is replaced, difference may occur between "Vdc" on the console display and actual voltage between ⊕ 2 - ⊖ . Please refer to Chapter4 4.16 S-area <Vdc detection gain automatic adjustment> if you want to adjust Vdc detection gain without initializing memory under the situation above.

**Analog input/output gain offset adjustment**

| Display | Items | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| L-01 | Analog input(1) gain | 50.00 to 150.00 | 0.01 | Adjusted | % |
| L-02 | Analog input(1) offset | -50.00 to 50.00 | 0.01 | Adjusted | % |
| L-03 | Analog output(1) gain | 50.0 to 150.0 | 0.1 | Adjusted | % |
| L-04 | Analog output(1) offset | -50.0 to 50.0 | 0.1 | Adjusted | % |
| L-05 | Analog input(2) gain | 50.00 to 150.00 | 0.01 | 100.00 | % |
| L-06 | Analog input(2) offset | -50.00 to 50.00 | 0.01 | 0.00 | % |
| L-07 | Analog input(3) gain | 50.00 to 150.00 | 0.01 | 100.00 | % |
| L-08 | Analog input(3) offset | -50.00 to 50.00 | 0.01 | 0.00 | % |
| L-09 | Analog output(2) gain | 50.0 to 150.0 | 0.1 | 100.0 | % |
| L-10 | Analog output(2) offset | -50.0 to 50.0 | 0.1 | 0.0 | % |
| L-11 | Analog output(3) gain | 50.0 to 150.0 | 0.1 | 100.0 | % |
| L-12 | Analog output(3) offset | -50.0 to 50.0 | 0.1 | 0.0 | % |
| L-13 | Analog input(4) gain | 50.00 to 150.00 | 0.01 | 100.00 | % |
| L-14 | Analog input(4) offset | -50.00 to 50.00 | 0.01 | 0.00 | % |
| L-15 | Analog input(5) gain | 50.00 to 150.00 | 0.01 | 100.00 | % |
| L-16 | Analog input(5) offset | -50.00 to 50.00 | 0.01 | 0.00 | % |
| L-17 | Analog output(4) gain | 50.0 to 150.0 | 0.1 | 100.0 | % |
| L-18 | Analog output(4) offset | -50.0 to 50.0 | 0.1 | 0.0 | % |
| L-19 | Analog output(5) gain | 50.0 to 150.0 | 0.1 | 100.0 | % |
| L-20 | Analog output(5) offset | -50.0 to 50.0 | 0.1 | 0.0 | % |

L-01 through L—20 are setting areas for adjusting gain and offset of the analog inputs/outputs.
It will be automatically set by analog output/input adjustment of S-area.

* For more information about S-area, please refer to Chapter3 3.16 S-area <Mode selection, analog input/output adjusting area> as well as Chapter4 4.16 <Mode selection, analog input/output adjusting area>.

**Inverter operation mode monitor setting**

| Display | Item | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| L-21 | Inverter operation mode monitor | SnPL (SIMPLE mode)<br>FuLL (FULL mode) | — | SnPL | — |

Inverter operation mode monitor (L-21) is available only for indication. "FuLL" is displayed when the inverter operation mode is FULL mode.

For the switching method to FULL mode, please refer to Chapter1 1.3 <Method to change to FULL mode>.

## 4.13. n-area (monitor adjusting area)

**Confirmation of inverter mode**

| Display | Item | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| n-00 | Inverter control mode | o: Induction motor V/f mode<br>V: Induction motor vector mode<br>E: ED motor vector mode | — | o | — |

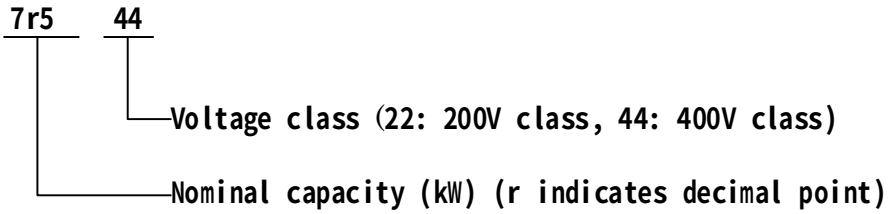
The inverter mode which has been set can be confirmed by reading out this setting.

Note: This setting is only for read out and is not writable (writing is always prohibited in this setting). Please refer to Chapter1 1.2 <Method to switch into Induction motor V/f mode> if you change the inverter mode.

**Confirmation of inverter capacity and voltage class**

| Display | Item | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| n-01 | Capacity / Voltage class | 2r222 to 9022<br>2r244 to 31544 | — | — | — |

Capacity and voltage class of current inverter setting can be confirmed by reading out this setting.




Note: This setting is only for read out and is not writable (writing is always prohibited in this setting). In case if capacity/voltage class of the inverter set in the VFC66-Z printed board is changed due to spare parts replacement or etc, then initialization of memory is required. For more information about memory initialization method, please refer to Chapter5 <Replacement of control print board VFC66-Z>.

**CAUTION**

**Inverter Capacity/Voltage class set in the VFC66-Z printed board and Capacity/Voltage class of the inverter which the printed board is installed must be conformed, otherwise normal operation cannot be obtained and may lead to accidents.**

## 4.14. o- area (Factory adjustment area)

**Factory adjusting analog output address, factory adjusting SET66-Z output address setting**

| Display | Items | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| o-00 | SpecialAdjustment | 0 to 65535 | — | — | — |
| o-01 | SpecialAdjustment | 0 to 65535 | — | — | — |
| o-02 | SpecialAdjustment | 0 to 65535 | — | — | — |
| o-03 | SpecialAdjustment | 0 to 65535 | — | — | — |
| o-04 to o-53 | SpecialAdjustment | These are for factory adjustment. Please stay on the factory default value. | — | — | — |

**Note: o-area is for factory adjustment and special purpose only and cannot be changed. No indication is displayed on the console monitor. Please stay on the factory default setting. (Error will be indicated if you attempt to write in this area.)**

## 4.15. P-area (Built-in PLC, P resistor setting area)

**Built-in PLC P resistor setting area**

| Display | Item | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| P-00 to 99 | P-resister constant setting | See separate booklet "User manual for VF66series PC Tool". | — | — | — |

**P-area is a setting area for the built-in PLC function constant. For more information, please refer to <VF66 series PC Tool user manual>. (This setting is unnecessary if built-in PLC is not used.)**

**Note: The value of -20000 or less cannot be input from the console panel (SET66-Z). If the value of -20000 or less is required to input in PLC function, please use VF66 series PC Tool. For more information, please refer to <VF66 series PC Tool user manual>.**

## 4.16. S-area (Mode selection, analog input/output adjusting area)

**Special mode selection**

| Display | Items | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| S-00 | Special mode selection | 1: Inverter initialization<br>2: Inverter mode change<br>3: Delete protection related<br>4: Switching between SIMPLE mode and FULL mode<br>12: DC mode auto-tuning (forward)<br>13: DC mode auto-tuning (reverse)<br>99:Inverter initialization(For factory adjustment) *1<br>101: Data transfer to SET66EX-Z<br>102: Data copy (exclude A-area) from SET66EX-Z)<br>103: Data copy (include A-area) from SET66EX-Z<br>104: Data comparison with SET66EX-Z | — | — | — |

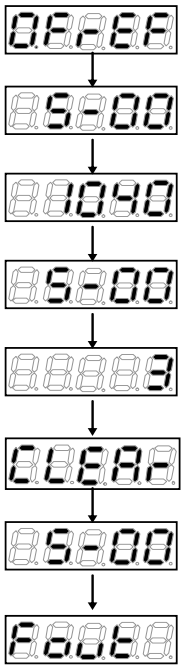
*1:Under normal conditions, please do not use this setting.

**Setting items of the Special mode selection (S-00)**

| S-00 setting | Description |
|---|---|
| 1 | Refer to Chapter5 5.3 <VF66B initialization method> for more detail. |
| 2 | Refer to Chapter1 1.2 < Switching to Induction motor V/f mode> for more information. |
| 3 | Refer to <Protection related erasing method> in this chapter for more detail. |
| 4 | For more information about switching between SIMPLE mode and FULL mode, please refer to Chapter1 1.3 <Switching to FULL mode>. |
| 12,13 | Refer to each item of Chapter1 1.4 <Automatic tuning> for more information about automatic tuning. |
| 99 | Under normal conditions, please do not use this setting. |
| 101 | For more information about data transfer method to SET66EX-Z, please refer to <Transfer of setting data to external console panel SET66EX-Z> in this chapter. |
| 102 | For detail of data copying method from SET66EX-Z (without A-area), please refer to <Copy of setting data from the external console panel SET66EX-Z to the inverter (without involving copy of A-area)> in this chapter. |
| 103 | For detail of data copying method from SET66EX-Z (with A-area), please refer to < Copy of setting data from the external console panel SET66EX-Z to the inverter (involving copy of A-area)> in this chapter. |
| 104 | For detail of data comparison method with SET66EX-Z, please refer to <Comparison between the data in the inverter (VF66B) and the data of the external console panel SET66EX-Z> in this chapter. |

**・Protection related erasing method**

**Explains procedure for erasing protection related items:**



④Press [MONI/FNC] key and select FNC (function selection) mode. (LED-FNC will lit)

②Use [↑][↓] key to select “S-00”. Press [SET] key to confirm.

③Use [JOG/→] key to shift the digit to the right, and [↑][↓] keys to select the number “1040” then press [SET] key to confirm. If you input number except 「1040」, 88888 is displayed on the console.

④“S-00” will appear again. Press [SET] to confirm.

⑤Use [JOG/→][↑][↓] keys to enter “3”, then press [SET] to confirm.

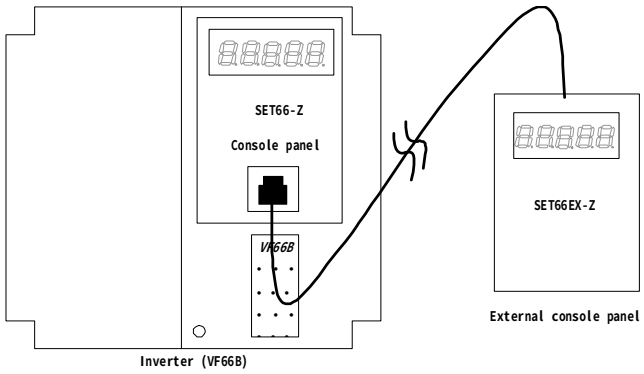
⑥ 「CLEAr」 is displayed on the console for 1.5sec.

⑦“S-00” will appear again. Data of protection history is erased.

⑧Press [MONI/FNC] key to turn off the LED of FNC. Monitor item such as “Fout” will be displayed for approx. 1sec. and then monitor items of current setting will be displayed.

**• Transfer of setting data to external console panel SET66EX-Z**

Data transferring method from the inverter (VF66B) to the external console panel SET66EX-Z is explained below:




Connect optional external console panel SET66EX-Z with the console panel SET66-Z on the inverter VF66B.

※ If you connect external console panel SET66EX-Z to the VF66B, you cannot use console panel (SET66-Z) on the VF66B.

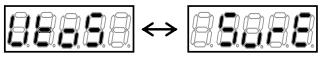
Press [MONI/FNC] key to turn on FNC (function selection) mode. (LED-FNC will lit)

Use [↑][↓] keys to select "S-00"("S" will blink). Press [SET] to confirm.

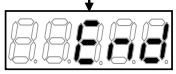
Use [JOG/→] key to shift the digit to right, and [↑][↓] keys to select "**1040**".
**Press [SET] to confirm it.** If you input number except 「1040」, is displayed on the console.

"S-00" will appear again. Press [SET] to confirm.

Use [JOG/→][↑][↓] keys to change the number to "101". Press [SET] to confirm it.


Alternating display of "VtoS" and "SurE" will appear.
Press [SET] to confirm it.
Note: No response if communication with SET66EX-Z is not established.

Display of "VtoS" will appear and data will be transferred from inverter (VF66B) to SET66EX-Z.


"End" will appear when the transfer is completed normally.

Inverter mode will be displayed for a few seconds and then returned to show monitor items.

Note: If normal communication is disturbed during data transfer, the data transfer is discontinued and display will return to inverter mode indication or is discontinued 10 seconds after the blink indication of .

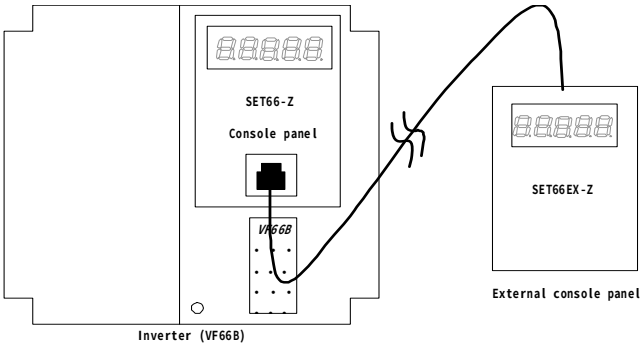
↓

To resume the data transfer, display is inverter mode after the discontinuance and then returns to monitor item indication, please repeat the process from the beginning.

**・Copy of setting data from the external console panel SET66EX-Z to the inverter (without involving copy of A-area)**

Data transferring method from the inverter (VF66B) to the external console panel SET66EX-Z is explained below.
Copy of A-area setting data is not involved.

Note: Apply below method when inverter type or motor type is changed.




Connect optional external console panel SET66EX-Z with the console panel SET66-Z on the inverter VF66B.

※ If you connect external console panel SET66EX-Z to the VF66B, you cannot use console panel (SET66-Z) on the VF66B.

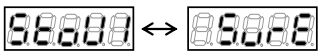
Press [MONI/FNC] key to turn on FNC (function selection) mode. (LED-FNC will be lit)

Use [↑][↓] keys to select "S-00" ("S" will blink). Press [SET] to confirm.

Use [JOG/→] key to shift the digit to right, and [↑][↓] keys to select "**1040**".
**Press [SET] to confirm it.** If you input number except 「1040」, is displayed on the console.

"**S-00**" will appear again. Press [SET] to confirm.

Use [JOG/→][↑][↓] keys to change the number to "102". Press [SET] to confirm it.


Alternating display of "StoV1" and "SurE" will appear.
Press [SET] to confirm it.
Note: No response if communication with SET66EX-Z is not established.

Display of "StoV1" will appear and data will be transferred from the external console panel SET66EX-Z to the inverter (VF66B).

"End" will appear when the transfer is completed normally.

5 seconds later, power-on operation will automatically initiated.

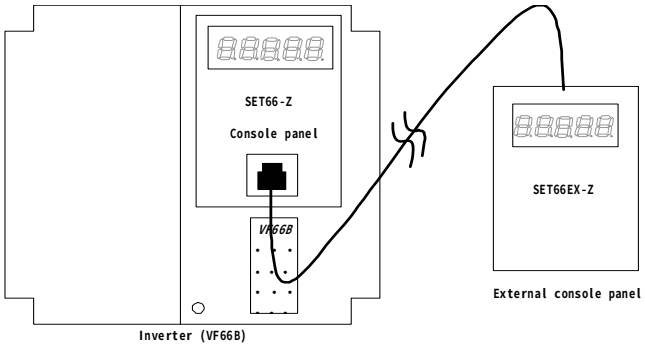
Note: If normal communication is disturbed during data transfer, the data transfer is discontinued and display will return to inverter mode indication or is discontinued 10 seconds after the blink indication of . ⇒ To resume the data transfer, please repeat the process from the beginning.

Note: When [SET] key is pressed after the alternating display of "StoV1" and "SurE" and if there is difference in software version between the inverter and the one stored in the external console panel, will blink. Data copy will be discontinued if [STOP/RESET] key is pressed during the indication of , and executed if [SET] key is pressed.

**・Copy of setting data from the external console panel SET66EX-Z to the inverter (involving copy of A-area)**

Data transferring method from the inverter (VF66B) to the external console panel SET66EX-Z is explained below. Copy of A-area setting data is involved.

Note: Apply below method if both inverter type and motor type are same.




Connect optional external console panel SET66EX-Z with the console panel SET66-Z on the inverter VF66B.

※ If you connect external console panel SET66EX-Z to the VF66B, you cannot use console panel (SET66-Z) on the VF66B.

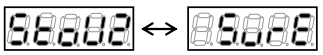
Press [MONI/FNC] key to turn on FNC (function selection) mode. (LED-FNC will lit)

Use [↑][↓] keys to select "S-00" ("S" will blink). Press [SET] to confirm.

Use [JOG/→] key to shift the digit to right, and [↑][↓] keys to select "**1040**".
**Press [SET] to confirm it.** If you input number except 「1040」, is displayed on the console.

"**S-00**" will appear again. Press [SET] to confirm.

Use [JOG/→][↑][↓] keys to change the number to "103". Press [SET] to confirm it.



Alternating display of "StoV2" and "SurE" will appear.
Press [SET] to confirm it.
Note: No response if communication with SET66EX-Z is not established.

Display of "StoV2" will appear and data will be transferred from the external console panel SET66EX-Z to the inverter (VF66B).

"End" will appear when the transfer is completed normally.

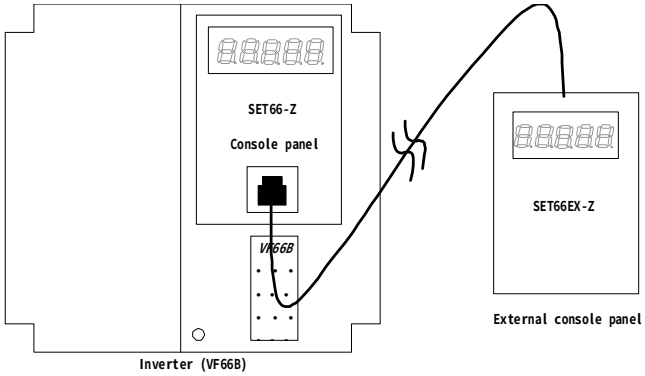
5 seconds later, power-on operation will automatically initiated.

Note: If normal communication is disturbed during data transfer, the data transfer is discontinued and display will return to inverter mode indication or is discontinued 10 seconds after the blink indication of . ⇒ To resume the data transfer, please repeat the process from the beginning.

Note: When [SET] key is pressed after the alternating display of "StoV1" and "SurE" and if there is difference in software version between the inverter and the one stored in the external console panel, will blink. Data copy will be discontinued if [STOP/RESET] key is pressed during the indication of and executed if [SET] key is pressed.

**• Comparison between the data in the inverter (VF66B) and the data of the external console panel SET66EX-Z**

Procedure of data comparison between the inverter (VF66B) and the external console panel SET66EX-Z is shown below:




Connect optional external console panel SET66EX-Z with the console panel SET66-Z on the inverter VF66B.

※ If you connect external console panel SET66EX-Z to the VF66B, you cannot use console panel (SET66-Z) on the VF66B.

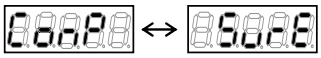
Press [MONI/FNC] key to turn on FNC (function selection) mode. (LED-FNC will be lit)

Use [↑][↓] keys to select "S-00" ("S" will blink). Press [SET] to confirm.

Use [JOG/→] key to shift the digit to right, and [↑][↓] keys to select "**1040**".
**Press [SET] to confirm it.** If you input number except 「1040」, is displayed on the console.

"**S-00**" will appear again. Press [SET] to confirm.

Use [JOG/→][↑][↓] keys to change the number to "103". Press [SET] to confirm it.


Alternating display of "ConP" and "SurE" will appear.
Press [SET] to confirm it.
Note: No response if communication with SET66EX-Z is not established.

Display of "ConP" will appear and data of the inverter (VF66B) and data of the external console panel SET66EX-Z will be compared.

"End" will appear when both data are conformed.

Inverter mode will be displayed for a few seconds and then returned to show monitor items.

is indicated if only the 1st set-up block is not conformed,

is indicated if only the 2nd set-up block is not conformed,

and is indicated if both 1st and 2nd set-up blocks are not conformed.

Note: If normal communication is disturbed during data transfer, the data transfer is discontinued and display will return to inverter mode indication or is discontinued 10 seconds after the blink indication of ⇒ To resume the data transfer, please repeat the process from the beginning.

**Cumulative time timer clear**

| Display | Items | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| S-01 | Cumulative operation timer (1) clear | 1: Clearing Timer (1) | — | — | — |
| S-02 | Cumulative operation timer (2) clear | 1: Clearing Timer (2) | — | — | — |

Count of the cumulative timer (1) can be cleared by setting "1" in the Cumulative timer (1) clear (S-01). Similarly, count of the cumulative timer (2) can be cleared by setting "1" in the Cumulative timer (2) clear (S-02).

**ROM rewritable switch**

| Display | Item | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| S-04 | ROM rewritable switch | Rewriting of ROM will be possible by entering "1040" after the power is on. | — | — | — |

To transfer PLC function program to ROM, The ROM rewritable switch (S-04) must be set to "1". For more information, please refer to <VF66 series PC Tool user manual>.

**Vdc adjustment, speed control gain automatic adjustment, analog gain and offset automatic adjustment**

| Display | Items | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| S-03 | Vdc adjustment | Vdc value (V): Vdc detection gain adjust | — | — | — |
| S-05 | — | — | — | — | — |
| S-06 | Analog input (1) adjust | 1: Analog input (1) offset adjustment<br>Input analog input (1) voltage (V) ×1000: Analog input (1) gain adjustment | — | — | — |
| S-07 | Analog output (1) adjust | 1: Analog output (1) offset adjustment<br>2: Analog output (1) gain adjustment | — | — | — |
| S-08 | Analog input (2) adjust | 1: Analog input (2) offset adjustment<br>Input analog input (2) voltage (V) ×1000: Analog input (2) gain adjustment | — | — | — |
| S-09 | Analog output (2) adjust | 1: Analog output (2) offset adjustment<br>2: Analog output (2) gain adjustment | — | — | — |
| S-10 | Analog input (3) adjust | 1: Analog input (3) offset adjustment<br>Input analog input (3) voltage (V) ×1000: Analog input (3) gain adjustment | — | — | — |
| S-11 | Analog output (3) adjust | 1: Analog output (3) offset adjustment<br>2: Analog output (3) gain adjustment | — | — | — |
| S-12 | Analog input (4) adjust | 1: Analog input (4) offset adjustment<br>Input analog input (4) voltage (V) ×1000: Analog input (4) gain adjustment | — | — | — |
| S-13 | Analog output (4) adjust | 1: Analog output (4) offset adjustment<br>2: Analog output (4) gain adjustment | — | — | — |
| S-14 | Analog input (5) adjust | 1: Analog input (5) offset adjustment<br>Input analog input (5) voltage (V) ×1000: Analog input (5) gain adjustment | — | — | — |
| S-15 | Analog output (5) adjust | 1: Analog output (5) offset adjustment<br>2: Analog output (5) gain adjustment | — | — | — |

**・Vdc detection gain automatic adjustment**

Before adjusting Vdc detection gain, set a DC voltmeter or a tester between ⊕2～⊖ of the inverter shown in the figure in <Instruction manual (installation) Chapter2 2.3 connecting method>, then turn ON the inverter.

**⚠CAUTION** [For your safety]

- DC voltmeter or tester measurable of 500V+ (for 200V class) or 1000V+ (for 400V class) should be used for measuring DC voltage.
- High voltage will be impressed on the DC voltmeter or tester during measurement. Voltage measurement shall be carried on by technician.
- Turn the power ON after the front cover is closed. There is risk of electrical shock.

Vdc detection gain (L-00) is automatically changed by following procedure:

Press [MONI/FNC] key to turn on FNC (function selection) mode. (LED-FNC will be lit)

Use [↑][↓] keys to select "S-00" ("S" will blink).

Use [JOG/→] key to shift the digit to right, and [↑][↓] keys to enter the number "03" (S-03) and press [SET] to confirm it.

Use [JOG/→] key to shift the digit to right, and [↑][↓] keys to select "1040".
Press [SET] to confirm it. If you input number except 「1040」, ERROR is displayed on the console.

"S-03" will appear again. Press [SET] to confirm.

Use JOG/→][↑][↓] keys to input the measured value of the voltmeter or tester installed on the inverter, then press [SET] to confirm it.

If "S-03" appears again, Vdc detection gain (L-00) will be automatically changed.
Press [MONI/FNC] to indicate monitor items.

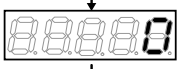
## •Adjustment of Analog input (1) gain (L-01) and Analog input (1) offset (L-02)

Followings are the changing procedure of Analog input (1) gain (L-01) and Analog input (1) offset (L-02).

Press [MONI/FNC] key to turn on FNC (function selection) mode. (LED-FNC will be lit)

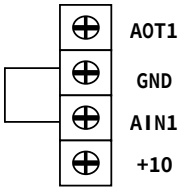
Use [↑][↓] keys to select “b-00”(“b” will blink).

Use [JOG/→] key to shift the digit to right, and [↑][↓] keys to enter the number “17” (**b-17**) and press [SET] to confirm it.



Use [JOG/→] key to shift the digit to right, and [↑][↓] keys to input “0”. Press **[SET] to confirm it.**

P board (VFC66-Z) Terminal block




Turn OFF the inverter, open the front cover, and short circuit between terminals [AIN1] and [GND] on the terminal block of the printed board (VFC66-Z).

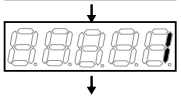
**CAUTION [Short circuiting of terminals]**

- Before short circuiting terminals, please be sure to turn OFF the inverter. There is a risk of electrical shock.

After power is ON, press [MONI/FNC] key to turn on FNC (function selection) mode. (LED-FNC will be lit). Use [JOG/→] [↑][↓] keys to select “S-06” then press [SET] to confirm it.

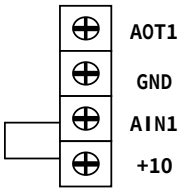
Use [JOG/→] [↑][↓] keys to input “1040” then press [SET] to confirm it. If you input number except 「1040」, EEEEE is displayed on the console.

“S-06” will appear again. Press [SET] to confirm.



Use [JOG/→] [↑][↓] keys to select “1” then press [SET] to confirm it.

P board (VFC66-Z) Terminal block




Turn OFF the inverter, open the front cover, and short circuit between terminals [AIN1] and [+10] on the printed board (VFC66-Z).

**CAUTION [Short circuiting of terminals]**

- Before short circuiting terminals, please be sure to turn OFF the inverter. There is a risk of electrical shock.

- After power is ON, press [MONI/FNC] key to turn on FNC (function selection) mode. (LED-FNC will be lit). Use [JOG/→] [↑][↓] keys to select “S-06” then press [SET] to confirm it.

- Use [JOG/→] [↑][↓] keys to input “1040” then press [SET] to confirm. If you input number except 「1040」, EEEEE is displayed on the console.

- “S-06” will appear again. Press [SET] to confirm.

Measure the voltage between terminals [AIN1] and [GND] with a tester and enter the 1000× of the measured value. If measurement is not available, the value “9930” can be used, however, accuracy is inferior.

**CAUTION [Voltage measurement]**

When the voltage between the terminals is measured, please be sure not to touch wirings or terminals. There is a risk of electrical shock.

If “S-06” appears again, Analog input (1) gain (L-01) and Analog input (1) offset (L-02) will be changed automatically.

Press [MONI/FNC] to indicate monitor items.

When adjustment is done, turn OFF the inverter, open the front cover, and remove the short circuit wirings installed between terminals [AIN1] and [+10] of VFC66-Z P board.

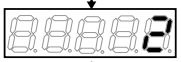
**・Adjustment of Analog input (1) gain (L-01) (when input characteristic of 4 to 20mA)**

Note: Adjustment of Analog input (1) gain (L-01) and Analog input (1) offset (L-02) in 0-10V is required before this adjustment.

Press [MONI/FNC] key to turn on FNC (function selection) mode. (LED-FNC will be lit)

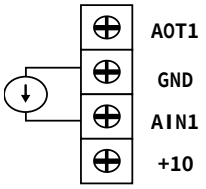
Use [↑][↓] keys to select "b-00" ("b" will blink).

Use [JOG/⟶] key to shift the digit to right, and [↑][↓] keys to enter the number "17" (b-17) and press [SET] to confirm it.



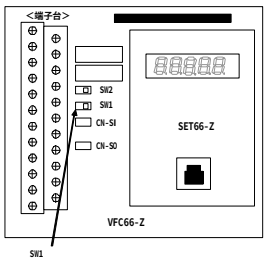
[Use [JOG/⟶] key to shift the digit to right, and [↑][↓] keys to input "2". Press [SET] to confirm it.

P board (VFC66-Z)
Terminal block



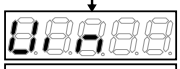

Turn OFF the inverter, open the front cover, connect current power between terminals [AIN1] and [GND] on the terminal block of printed board (VFC66-Z).

Turn the SW1 ON (terminal block side) while the power of inverter is OFF.

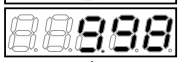



**⚠CAUTION [Connection of current power]**

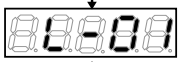
- Before connecting current power, please be sure to turn OFF the inverter.
  There is a risk of electrical shock.
- Please be sure to turn OFF the inverter before switching a switch.
  There is a risk of electrical shock.



・After power is ON, select "Vin" with [↑][↓] keys of monitor items.



・Turn the current power ON, and apply the current of 20mA to [AIN1] terminal.
・A number will be displayed.



・Adjust the value of L-01 so that the value of monitor item "Vin" becomes "10.00".

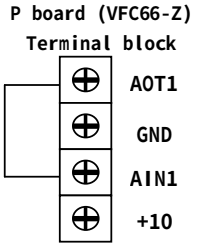
Note: For display of the monitor item "Vin", the item displayed can be changed by changing setting of Analog input monitor display selection (G-16). For more information, please refer to Chapter4 4.8 G-area.

When adjustment is done, remove the current power.

**・Adjustment of Analog output (1) gain (L-03) and Analog output (1) offset (L-04)**

Note: Adjustment of Analog input (1) offset and gain is required before this adjustment.

Followings are the changing procedure of Analog output (1) gain (L-03) and Analog output (1) offset (L-04).

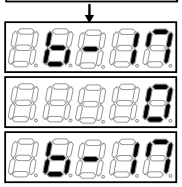



Turn OFF the inverter, open the front cover, and short circuit between terminals [AOT1] and [AIN1] on the terminal block of the printed board (VFC66-Z).

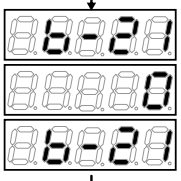
**⚠CAUTION [Short circuiting of terminals]**

- Before short circuiting terminals, please be sure to turn OFF the inverter. There is a risk of electrical shock.

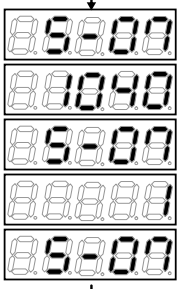
After power is ON, press [MONI/FNC] key to turn on FNC (function selection) mode. (LED-FNC will be lit).



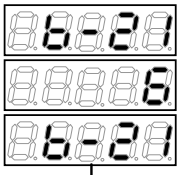
・Use [JOG/→] [↑][↓] keys to select “b-17” then press [SET] to confirm it.
・Use [JOG/→] [↑][↓] keys to input “0” and press [SET] to confirm it.
・“b-17” will appear again.



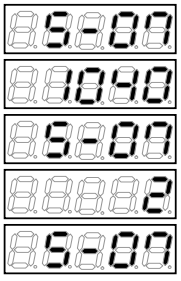
・Use [JOG/→] [↑][↓] keys to select “b-21” then press [SET] to confirm it.
・Use [JOG/→] [↑][↓] keys to input “0” and press [SET] to confirm it.
・“b-21” will appear again.



・Use [JOG/→] [↑][↓] keys to select “S-07” then press [SET] to confirm it.
・Use [JOG/→] [↑][↓] keys to input “1040” then press [SET] to confirm it. If you input number except 「1040」, 88888 is displayed on the console.
・“S-07” will appear again. Press [SET] to confirm.
・Use [JOG/→] [↑][↓] keys to input “1” and press [SET] to confirm it.
・“S-07” will appear again.



・Use [JOG/→] [↑][↓] keys to select “b-21” then press [SET] to confirm it.
・Use [JOG/→] [↑][↓] keys to input “6” then press [SET] to confirm it.
・“b-21” will appear again.



・Use [JOG/→] [↑][↓] keys to select “S-07” then press [SET] to confirm it.
・Use [JOG/→] [↑][↓] keys to input “1040” then press [SET] to confirm it. If you input number except 「1040」, 88888 is displayed on the console.
・“S-07” will appear again. Press [SET] to confirm.
・Use [JOG/→] [↑][↓] keys to input “2” then press [SET] to confirm it.
・If “S-07” appears again, Analog output (1) gain (L-03) and Analog output (1) offset (L-04) will be changed automatically.
・Press [MONI/FNC] to indicate monitor items.

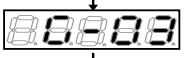
**・Adjustment of offset and gain of Analog input (2) through (5)**

Note: Optional IO66-Z, IOEXT66-Z or Communication option boards are required for Analog input (2) through (5). This setting is unnecessary if IO66-Z, IOEXT66-Z or Communication option board is not used. Also adjustment of Analog input (1) offset and gain is required before this adjustment.

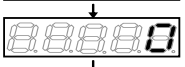
Followings are changing procedure of Analog input (2) - (5) gain and Analog input (2) - (5) offset.

Only changing procedure of Analog input (2) gain/offset (L-05/L-06) is shown here. For gain/offset of Analog input (3) through (5), set the setting items in G-area and S-area to be compatible with Analog input (3) through (5) then follow the same procedure as Analog input (2).

Press [MONI/FNC] key to turn on FNC (function selection) mode. (LED-FNC will be lit)

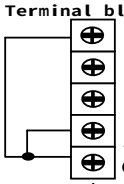


Use [↑][↓] keys to select "G-03"*1 and press [SET] to confirm it.



Use [JOG/→] key to shift the digit to right, and [↑][↓] keys to input "0". Press [SET] to confirm it.

P board (VFC66-Z) Terminal block

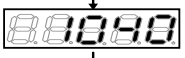



Turn OFF the inverter, open the front cover, and short circuit between terminals [AIN2]-[G]-[G-IN] on the terminal block of option P board (IO66-Z).

**CAUTION [Short circuiting of terminals]**

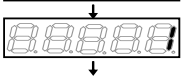
- Before short circuiting terminals, please be sure to turn OFF the inverter. There is a risk of electrical shock.

After power is ON, press [MONI/FNC] key to turn on FNC (function selection) mode. (LED-FNC will be lit). Use [JOG/→] [↑][↓] keys to select "S-08"*2 then press [SET] to confirm it.



Use [JOG/→] [↑][↓] keys to input "1040" then press [SET] to confirm it. If you input number except 「1040」, EEEEE is displayed on the console.

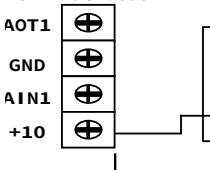
"S-08"*2 will appear again. Press [SET] to confirm.



Use [JOG/→] [↑][↓] keys to select "1" then press [SET] to confirm it.

board (VFC66-Z) Terminal block

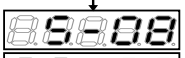
P board (IO66-Z) Terminal block




Turn OFF the inverter, open the front cover, and short circuit between [AIN2] terminal of the printed board (IO66-Z) and [+10] terminal of the printed board (VFC66-Z). Remain short circuited terminals between [G] and [G-IN] of the printed board (IO66-Z).

**CAUTION [Short circuiting of terminals]**

- Before short circuiting terminals, please be sure to turn OFF the inverter. There is a risk of electrical shock.



・After power is ON, press [MONI/FNC] key to turn on FNC (function selection) mode. (LED-FNC will be lit). Use [JOG/→] [↑][↓] keys to select "S-08"*2 then press [SET] to confirm it.

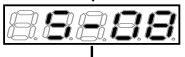
・Use [JOG/→] [↑][↓] keys to input "1040" then press [SET] to confirm. If you input number except 「1040」, EEEEE is displayed on the console.

・"S-08"*2 will appear again. Press [SET] to confirm.

Measure the voltage between terminals [AIN1] and [GND] with a tester and enter the 1000× of the measured value. If measurement is not available, the value "9930" can be used, however, accuracy is inferior.

**CAUTION [Voltage measurement]**

- When the voltage between the terminals is measured, please be sure not to touch wirings or terminals. There is a risk of electrical shock.



If "S-08"*2 appears again, Analog input (2) gain (L-05)*3 and Analog input (2) offset (L-06)*3 will be changed automatically. Press [MONI/FNC] to indicate monitor items.

When adjustment is done, turn OFF the inverter, open the front cover, and remove the short circuit wirings installed between terminals [AIN2] on the IO66-Z P board and [+10] on the VFC66-Z P board, as well as [G] and [G-IN] on the IO66-Z P board.

*1: For Analog input (3) through (5), please refer to Chapter4 4.8 G-area and set corresponding items.

*2: For Analog input (3) through (5), please refer to Chapter4 4.16 S-area and set corresponding items.

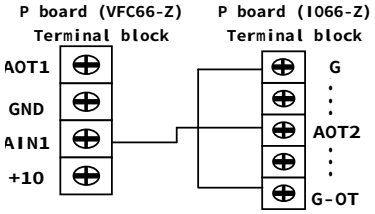
*3: For Analog input (3) through (5), please refer to Chapter4 4.12 L-area and set corresponding items.

## •Adjustment of offset and gain of Analog output (2) through (5)

Note: Optional IO66-Z, IOEXT66-Z or Communication option board are required for Analog output (2) through (5). This setting is unnecessary if IO66-Z, IOEXT66-Z or Communication option board is not used. Also adjustment of Analog input (1) offset and gain is required before this adjustment.

Followings are changing procedure of Analog input (2) - (5) gain and Analog output (2) - (5) offset.

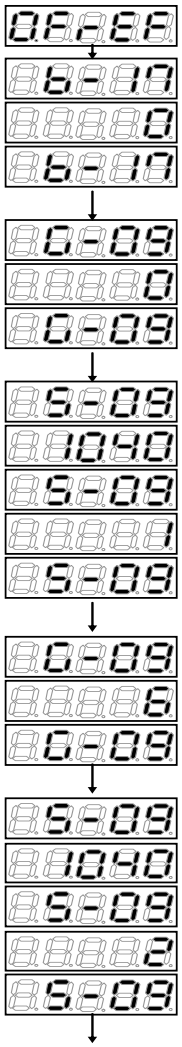
Only changing procedure of Analog output (2) gain/offset (L-05/L-06) is shown here. For gain/offset of Analog output (3) through (5), set the setting items in G-area and S-area to be compatible with Analog output (3) through (5) then follow the same procedure as Analog output (2).




Turn OFF the inverter, open the front cover, and short circuit between terminals [AOT2] on the printed board (IO66-Z) and [AIN1] on the printed board (VFC66-Z) as well as [G] and [G-OT] on the printed board (IO66-Z).
Note: Use terminal [AIN1] as an analog input when setting Analog output (3) through (5).

**CAUTION [Short circuiting of terminals]**

- Before short circuiting terminals, please be sure to turn OFF the inverter. There is a risk of electrical shock.




After power is ON, press [MONI/FNC] key to turn on FNC (function selection) mode. (LED-FNC will be lit).

- [JOG/→] [↑][↓] keys to select "b-17" then press [SET] to confirm it.
- Use [JOG/→] [↑][↓] keys to input "0" and press [SET] to confirm it.
- "b-17" will appear again.

- Use [JOG/→] [↑][↓] keys to select "G-09"*1 then press [SET] to confirm it.
- Use [JOG/→] [↑][↓] keys to input "0" then press [SET] to confirm it.
- "G-09" will appear again.

- Use [JOG/→] [↑][↓] keys to select "S-09"*2 then press [SET] to confirm it.
- Use [JOG/→] [↑][↓] keys to input "1040" then press [SET] to confirm it. If you input number except 「1040」, ######## is displayed on the console.
- "S-09"*2 will appear again. Press [SET] to confirm.
- Use [JOG/→] [↑][↓] keys to input "1" and press [SET] to confirm it.
- "S-09"*2 will appear again.

- Use [JOG/→] [↑][↓] keys to select "G-09"*1 then press [SET] to confirm it.

Note: For Analog output (3) - (5), change the number accordingly.

- Use [JOG/→] [↑][↓] keys to input "6" then press [SET] to confirm it.
- "G-09"*1 will appear again.

- Use [JOG/→] [↑][↓] keys to select "S-09"*2 then press [SET] to confirm it.
- Use [JOG/→] [↑][↓] keys to input "1040" then press [SET] to confirm it. If you input number except 「1040」, ######## is displayed on the console.
- "S-09" will appear again. Press [SET] to confirm.
- Use [JOG/→] [↑][↓] keys to input "2" then press [SET] to confirm it.
- If "S-09"*2 appears again, Analog output (2) gain (L-09)*3 and Analog output (2) offset (L-10)*3 will be changed automatically.
- Press [MONI/FNC] to indicate monitor items.

When adjustment is done, turn OFF the inverter, open the front cover, and remove the short circuit wirings installed between terminals [AOT2] on the IO66-Z P board and [AIN1] on the VFC66-Z P board, as well as [G] and [G-OT] on the IO66-Z P board.

*1: For Analog input (3) through (5), please refer to Chapter4 4.8 G-area and set corresponding items.

*2: For Analog input (3) through (5), please refer to Chapter4 4.16 S-area and set corresponding items.

*3: For Analog input (3) through (5), please refer to Chapter4 4.12 L-area and set corresponding items.

# Chapter 5 Replacement of control board VFC66-Z

## 5.1. Replacement of control printed circuit board VFC66-Z with stock parts

When the control printed board VFC66-Z is replaced with stock parts, setting of inverter capacity, motor rate (value on the plate), automatic tuning data and gain adjustment of the analog circuit are required in order to match the parts with the inverter currently using.

## 5.2. Replacement of control board VFC66-Z

**⚠CAUTION** [Replacement of printed board VFC66-Z]

- Please be sure to turn OFF inverter before opening or closing front cover.
  There is risk of electrical shock.

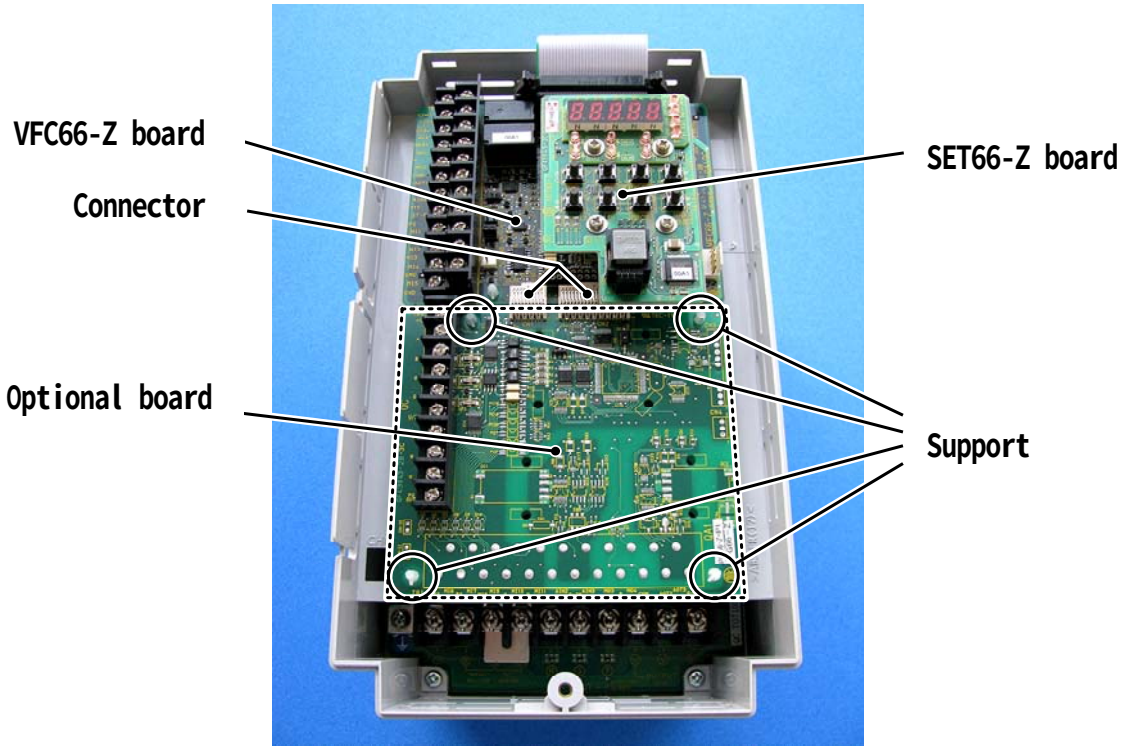



Fig.5.1 Inverter removed front cover (VF66B-2R222)

① Open the front cover.
(Please refer to instruction manual (installation) Chapter2 2.2 <Opening / closing of front cover>)

② Remove SET66-Z board. Remove 4 screws indicated by circles in the right figure, and pull out SET66-Z board from the VFC66-Z board.

③ Remove optional board. Disconnect two connectors located between VFC66-Z board and option board. Fig.5.3 (a) is showing the condition with connectors connected. As shown in Fig.5.3 (b), pull the knob of the connector upward to disengage connection.

④ There are four supports indicated by circles in Fig.5.1 which fixes

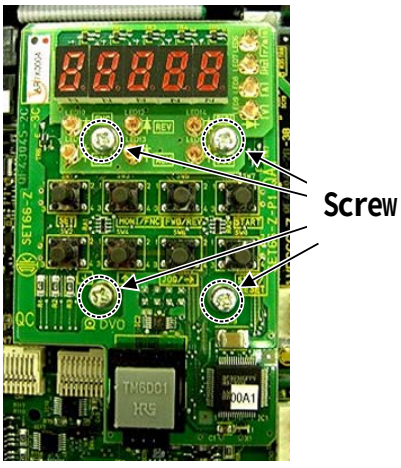
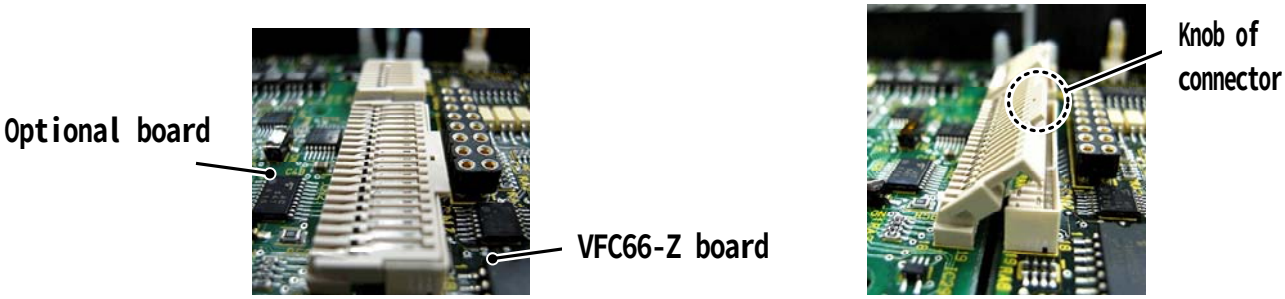



Fig.5.2 SET66-Z board

the option board to the inverter. Remove the option board while pushing the latch of the support.




(a) Connector engaged (b) Knob of connector

Fig.5.3 Connector

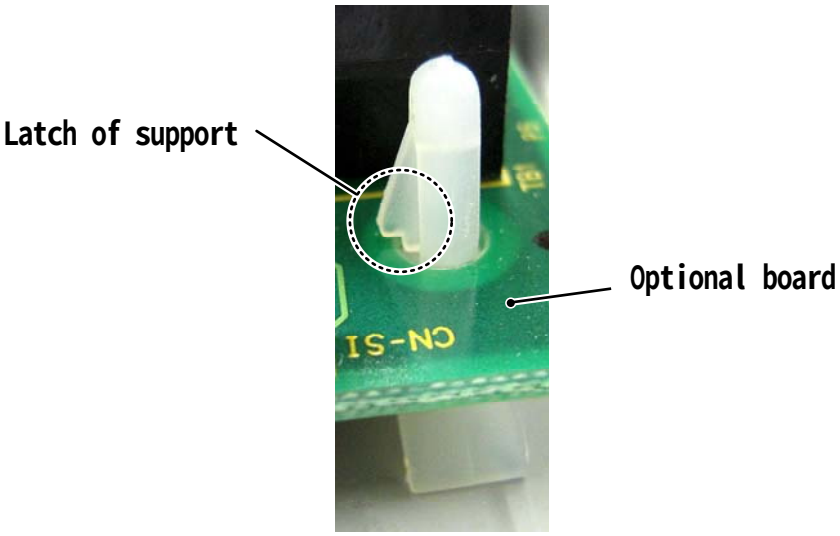



Fig.5.4 Latch of support

⑤ Like above mentioned option board, VFC66-Z board also has supports to fix the board to the inverter. Remove the VFC66-Z board while pushing the latch of the support. Align four holes with four supports, push the board downward until latches lock the board as shown in Fig.5.4.

⑥ Align four holes of the option board with four supports circled in Fig.5.1 and push the board downward until latches lock the board as shown in Fig.5.4.

⑦ Push the knob of connectors CN1 and CN2 on the option board downward, align them with the connector CN7 and CN4 of the VFC66-Z board respectively and connect them (refer to Fig.5.3 (a) and (b)). Because of the elasticity of the connector, connection may come off if connection is inadequate. Please connect the connector firmly.

⑧ Install back the SET66-Z board again.

⑨ Put the cover of the inverter back again.

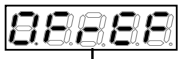
## 5.3. Initialization of VF66B

**Capacity setting of VF66B can be set by initializing the inverter. Followings are concrete procedure of the setting.**

**Before initializing the inverter, install a DC voltmeter or a tester between ⊕ 2- ⊖ of the inverter shown in the figure in the instruction manual (installation) Chapter2 2.3 <Connecting method> and then turn ON the inverter.**

**CAUTION** [For your safety]

- **DC voltmeter or tester measurable of 500V+ (for 200V class) or 1000V+ (for 400V class) should be used for measuring DC voltage.**
- **High voltage will be impressed on the DC voltmeter or tester during measurement. Voltage measurement shall be carried on by technician.**
- **Turn the power ON after the front cover is closed. There is risk of electrical shock.**

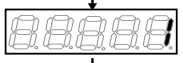


**①Press [MONI/FNC] key to turn on FNC (function selection) mode. (LED-FNC will be lit.)**

**②Use [↑][↓] keys to select "S-00" and press [SET] to confirm.**

**③Use [JOG/→] key to shift the digit to right, and [↑][↓] keys to enter "1040". If you input number except 「1040」, is displayed on the console. Press [SET] to confirm it and press [STOP/RESET] key to quit initialization.**

**④"S-00" will appear again. Press [SET] to confirm.**



**⑤Use [JOG/→][↑][↓] keys to input "1".**

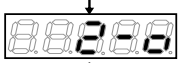
**Message of will be displayed sequentially.**

**⑥**"SurE"will be blinking on the display, press [SET] key to confirm.
Or press **[STOP/RESET] key to quit initialization.**

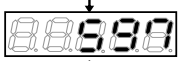
**⑦Inverter type will be displayed. Use [↑][↓] keys to select the inverter type and press [SET]to confirm the selection.**

**⑧Inverter capacity will displayed. Use [↑][↓] keys to select the capacity, then press [SET] to confirm it.**
**<In case of left figure, the capacity is 7.5kw, 400V class>**

⑨Selection for the 1st set-up block is displayed. Select the inverter mode from below:
To change the mode, use **[↑][↓] keys to select a mode.**
**o**：Induction motor V/f mode
**V**：Induction motor vector mode
**E**：ED motor vector mode
<In case of left figure, Induction motor V/f mode has been selected for the 1st set-up mode.>



⑩Selection for the 2nd set-up block is displayed. Like the selection for the 1st set-up block, select an inverter mode for 2nd set-up block from "o", "V"or "E"using [↑][↓] keys.
<In case of left figure, Induction motor V/f mode has been selected for the 2nd set-up mode.>



**⑪DC voltage will displayed. Use [JOG/→][↑][↓] keys to input the measured value of the voltmeter or tester installed on the inverter, then press [SET] to confirm it.**
**<In case of left figure, DC voltage is 597V>**

**Display for a few seconds then change to and complete memory initialization.**

**Approximately 5 seconds later, the display will return to show inverter type, capacity and voltage.**

## 5.4. Adjustment of Analog input gain

**Following items are for adjustment of analog input gain:**

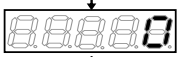
| Display | Items | Set-up range (Item selection) | Set-up resolution | Default data | Unit |
|---|---|---|---|---|---|
| L-01 | Analog input(1) gain | 50.00 to 150.00 | 0.01 | Adjusted | % |
| L-02 | Analog input(1) offset | -50.00 to 50.00 | 0.01 | Adjusted | % |

**Analog input (1) gain (L-01) and Analog input (1) offset (L-02) can be changed by following procedure:**

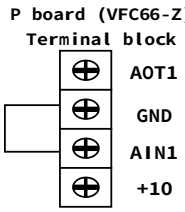
Press [MONI/FNC] key to turn on FNC (function selection) mode. (LED-FNC will be lit)

Use [↑][↓] keys to select "b-00" ("b" will blink).

Use [JOG/→] key to shift the digit to right, and [↑][↓] keys to enter the number "17" (**b-17) and press [SET] to confirm it.**



[Use [JOG/→] key to shift the digit to right, and [↑][↓] keys to input "0". Press **[SET] to confirm it.**




Turn OFF the inverter, open the front cover, connect current power between terminals [AIN1] and [GND] on the terminal block of printed board (VFC66-Z).

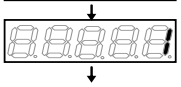
**CAUTION [Short circuiting of terminals]**

- Before short circuiting terminals, please be sure to turn OFF the inverter. There is a risk of electrical shock.

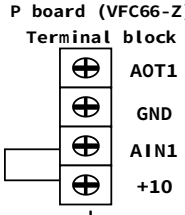
After power is ON, press [MONI/FNC] key to turn on FNC (function selection) mode. Use [JOG/→] [↑][↓] keys to select "S-06" and press [SET] to confirm it.

Use [JOG/→] [↑][↓] keys to input "1040" then press [SET] to confirm it. If you input number except 「1040」, ###### is displayed on the console.

"S-06" will appear again. Press [SET] to confirm.



Use [JOG/→] [↑][↓] keys to input "1" and press [SET] to confirm it.




Turn OFF the inverter, open the front cover, and short circuit between terminals [AIN1] and [+10] on the terminal block of the printed board (VFC66-Z).

**CAUTION [Short circuiting of terminals]**

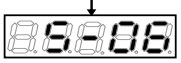
- Before short circuiting terminals, please be sure to turn OFF the inverter. There is a risk of electrical shock.

- After power is ON, press [MONI/FNC] key to turn on FNC (function selection) mode. (LED-FNC will be lit). Use [JOG/→] [↑][↓] keys to select "S-06" then press [SET] to confirm it.
- Use [JOG/→] [↑][↓] keys to input "1040" then press [SET] to confirm it. If you input number except 「1040」, ###### is displayed on the console.
- "S-06" will appear again. Press [SET] to confirm.

Measure the voltage between terminals [AIN1] and [GND] with a tester and enter the 1000× of the measured value. If measurement is not available, the value "9930" can be used, however, accuracy is inferior.

**CAUTION [Voltage measurement]**

- When the voltage between the terminals is measured, please be sure not to touch wirings or terminals. There is a risk of electrical shock.



If "S-06" appears again, Analog input (1) gain (L-01) and Analog input (1) offset (L-02)will be changed automatically.

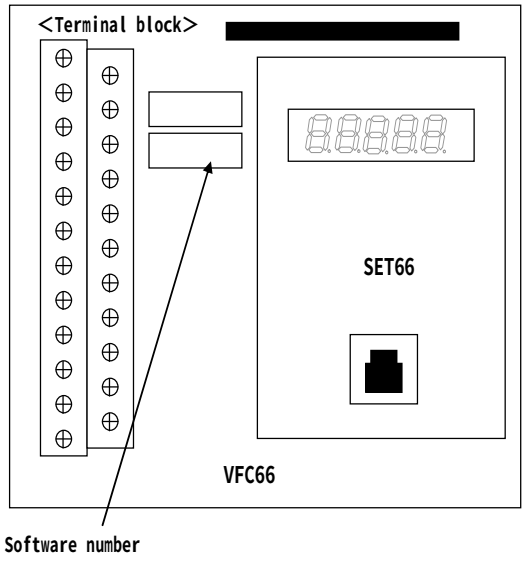
# Chapter 6 Spare parts and technical assistance

Please let us know following information when you ordering spare parts or requesting technical assistance.

1) Inverter type, capacity (kW) and input voltage (V)

2) Motor type, capacity (kW), rated motor speed (rpm), rated motor voltage and pole number of the motor

3) Serial number and software version number (Software number can be find on the label pasted on the control printed board VFC66-Z as shown in the figure below.)




4) Situation at the failure and description of failure.

5) Operational status, load condition, environmental condition and date of purchase

6) Name of dealer or sales representative department

## Our request to dealers

When your product using this inverter is shipped, please make sure so that this instruction manual is deliver to your end user.
Also, if the setting value of this inverter has been changed from the factory default value, please notify the change to the end user.

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QG18534
2009-10